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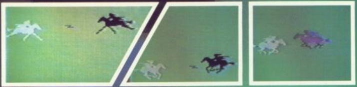

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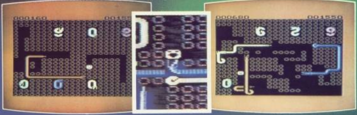

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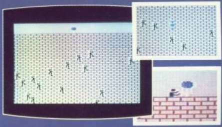

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Personal Computer GAMES

Dear Reader,

Welcome to the first issue of *Personal Computer Games* – Britain's newest magazine for microcomputer games enthusiasts.

There has been such a surge of interest in computer games recently that the problem facing most people is not so much finding enough games, as deciding how to choose among the thousands of packages available.

That's where *Personal Computer Games* can really help you.

If you want to know what a game actually looks like on the screen before you buy it, take a look at our exclusive Action Freeze! section. It will show you in full colour precisely what you will see when you run the program.

The display is only the beginning of the story. Look a little further on in the magazine, and you will find page after page of games reviews.

They tell you honestly just what you will – and will not – get for your money.

And for the most up-to-date news on what is available and where to get it, turn to the listings in Screen Scroll.

Of course, we have not forgotten the all-important hardware. We have scoured the shops for the zappiest peripherals around.

We even take a 'no holds barred' look at two of the most recent home computers: the Oric-1 and the Lynx.

As if that was not enough, we are offering you the chance to win a free home computer package.

We'll be featuring the winning entry in our next issue. And who knows, you might end up like 17-year old Richard Jones, whom we interview in this issue.

Whatever your age and interest, or the size of your pocket, you're sure to find *Personal Computer Games* packed with fascinating and really useful information.

Good reading!

Editor

WHAT'S G A

NEWS

The latest information on games just released – and those still being planned ... Dragonalia comes to your screen ... and Sing-a-Long-a Micro. pages 2,3

THE LIFE GAME

How Richard Jones challenged the competitive market of computer games, and launched three successful companies by the time he was 17. page 8

ADVENTURE

The Program Control Guardians protect the world from rogue games. They introduce themselves to you in the first of a regular series. page 15

COMMANDER CHANCE
HAL

COMPETITION

Let your imagination run riot and win a computer that has been specially designed for games enthusiasts. page 17

BOOSTERS

It is often difficult to find the right peripherals to boost your micro's powers and your fun. Our special review tracks down the suppliers for you. page 18

THOUGHTS

Puzzles for high, medium and not-so-low IQs. From Mensa, the high IQ society. page 27

Typesetting by: Spectrum Typesetting, London N1 Origination by Fourmost Colour, London EC1

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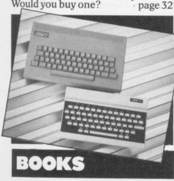
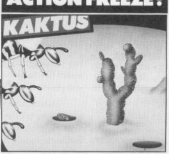
M E S

HARDWARE

The newest British micros include a strong rival to the Spectrum and a very upgradable home computer. Would you buy one? page 32



ACTION FREEZE!



Six popular games have been timed and frozen in mid-action. We take off the trimmings to show you what they are really like. page 50

BOOKS

If you are trapped in the micro maze, you need a good guide. We review some books that can give you an open sesame. page 47

D-I-Y

A selection of program listings that will bring you hours of fun, pleasure and frustration. page 67

HUMOUR

YOU REALLY SHOULD HAVE HAD HIM VACCINATED AGAINST COMPUTER GAMES!
Kipper Williams

Commodore ... karate ... poltergeists ... and health. Kipper Williams sketches the trials of games addicts and goes over the top. page 48

SCREEN SCROLL

Try before you buy. We did. And we tell you what we think. page 93

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Announcing more exciting programs for the BBC.

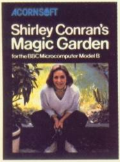
Acornsoft is the software division of Acorn Computers, the company that designed and built the BBC Microcomputer. Here are four more exciting programs, all designed to get the most from your BBC Micro.

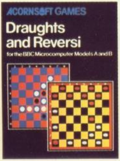
Magic Garden (£9.95) is a cassette based on Shirley Conran's successful book. It's a problem-solving program which provides the complete beginner with instant answers to the questions of what to plant and where. Simply tell the computer whether you prefer a shrub or a flower, the type of soil, light and shade conditions and required flowering time and the computer will come up with a selection of possible plants.

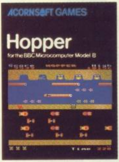
Draughts & Reversi (£9.95) is a cassette containing two traditional board games for you to play against the computer. Both give a graphic display of the board on the screen and you can enter your moves with either keyboard or joystick. The games can be played at varying levels of difficulty and on the higher levels you will find the computer to be a very worthy adversary.

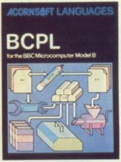
Hopper (£9.95) is a game on cassette which can be played with either keyboard or joysticks. Hop the frog across the busy motorway trying to avoid four lanes of fast-moving traffic. To get across the river to the frog's lair you must leap on to the logs and turtles' backs, but beware of the diving turtles, the crocodile and the snake.

BCPL (£99.65) is a flexible modern structured language that's very easy to learn. The package consists of a BCPL language ROM, a 40/80 disc and a 450 page User Guide. The disc contains the BCPL Computer, a Screen Editor and a 6502 Assembler. BCPL is particularly good at handling Input and Output and is ideal for writing utility programs and to develop games and commercial packages.


ACORNSOFT
Shirley Conran's Magic Garden
for the BBC Microcomputer Model B







How to get Acornsoft programs.

If you're a credit card holder and would like to buy the programs shown in this advertisement, or if you would like to know the address of your nearest stockist, just phone 01-200 0200.

Alternatively, you can buy the programs directly by sending off the order form below to:
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ACORNSOFT

Place	Weeks on Chart	Game · Publisher
1	13	**Zaxxon** · Datasoft
2	2	**Miner 2049er** · Big Five
3	38	**Frogger** · Sierra On-Line
4	38	**Deadline** · Infocom
5	37	**Zork II** · Infocom
6	28	**Zork III** · Infocom
7	38	**Temple of Apshai** · Epyx
8	38	**Zork I** · Infocom
9	39	**Choplifter** · Broderbund
10	9	**Suspended** · Infocom
11	34	**Snooper Troops #1** · Spinnaker
12	40	**Wizardry** · Sir-Tech
13	34	**Apple Panic** · Broderbund
14	34	**Snooper Troops #2** · Spinnaker
15	25	**Castle Wolfenstein** · Muse
16	22	**Miner 2049er** · Micro Lab
17	24	**Ulysses & the Golden Fleece** · Sierra On-Line
18	11	**AE** · Broderbund
19	2	**Dig Dug** · Atari
20	29	**Starcross** · Infocom
21	25	**Flight Simulator** · Sublogic
22	6	**B-1 Nuclear Bomber** · Avalon Hill
23	25	**Flight Simulator** · Microsoft
24	31	**Pinball** · Sublogic
25	4	**Shamus: Case II** · Synapse
26	10	**Jump Man** · Epyx
27	37	**Sargon II** · Hayden
28	1	**Donkey Kong** · Atari
29	15	**Fort Apocalypse** · Synapse
30	38	**Preppie** · Adventure International
31	13	**Sea Dragon** · Adventure International
32	11	**Necromancer** · Synapse
33	1	**Repton** · Sirius
34	38	**Shamus** · Synapse
35	31	**Crossfire** · Sierra On-Line
36	30	**Aztec** · Datamost
37	1	**Frogger** · Comsoft
38	28	**Serpentine** · Broderbund
39	8	**Pharaoh's Curse** · Synapse
40	6	**Spy's Demise** · Penguin
41	14	**Gorf** · Roklan
42	39	**Knight of Diamonds** · Sir-Tech
43	2	**Final Orbit** · Sirius
44	1	**VC** · Avalon Hill
45	20	**Way Out** · Sirius
46	20	**Wizard of Wor** · Roklan
47	30	**Mask of the Sun** · Ultrasoft
48	28	**Centipede** · Atari
49	36	**Canyon Climber** · Datasoft
50	37	**Ali Baba & the Forty Thieves** · Quality

Chart courtesy of Softsel International.

THE WORLD'S TOP GAMES

The chart above shows Softsel's hot list of games as at the middle of June. It is compiled from sales to over 4,000 retail outlets in 50 states and 30 countries.

Softsel is the world's largest wholesale distributor of personal computer software. It supplies more than 3,000 product lines to over 4,000 outlets worldwide. European operations are centred at Feltham, near Heathrow airport.

Software for Apple, Atari, IBM, Commodore, Tandy, Texas Instruments, and CP/M micros is available from Softsel through such suppliers as Thorn EMI, Micro Soft, Sierra On-line, Broderbund, Micropro, IUS, Automated Simulation, Infocom, Sirius and Spinnaker.

In June, major multiple computer retailer Spectrum signed Softsel as its sole source for US software. The announcement gave Softsel over 350 outlets only two months after its UK launch in April.

JUST ARRIVED

English Software is proving to be one of the most prolific independent producers of software for the Atari.

In June, it announced no less than 11 new cassette games for the Atari 400/800. The programs included Airstrike, Venus Voyager 2, Timewarp, Escape from Perilous, Xenon Raid, Firefleet, Diamonds, Krazy Kopter, and Caverunner.

All sell for £14.95 including VAT.

August will see four more games: Hyperblast, Captain Sticky's Treasure, Airstrike 2, and Jet Boot Jack. These are on cartridge and sell at the dearer price of £29.95.

English Software says it plans to release at least one new game program every month. 'We're always on the look out for new programmers,' it avers.

English Software can be contacted at 50 Newton Street, Piccadilly, Manchester M1 2EA. Tel: (061) 236 7259.

Softek launched six new games at the beginning of June. Four are for the Spectrum, one is for the Oric, and one is for the Dragon.

Amongst the new Spectrum games is Joust, written by 15-year-old Andrew Gleister.

Firebirds is a shoot-up vertical game, while Megapede provides a very high-quality version of the Centipede arcade game.

The Spectrum games cost £5.95; the others cost slightly more.

PSST – IS THIS THE ULTIMATE?

Recently established Ultimate Play the Game sees itself as 'the most experienced arcade video game design team in Britain'.

Its members were some of the first people to produce arcade games for the US and Japan.

'We were unhappy working for someone else,' said director Timothy Stamper, 'so we decided to set up our own company.'

The turnover is high, and is all reinvested in the company.

Ultimate's aim is to produce a range of entirely original arcade-quality home computer software. Its first offering, Jet Pac, was released in May.

Suitable for 16K or 48K Spectrums, Jet Pac is comprised of 16 waves of aliens, with four spaceships to assemble, each of which is divided into three sections.

True to its arcade origins, the program includes a player/game selection page which allows you to choose one- or two-player games, and a keyboard or Kempston joystick select. This selection appears after each game is played.

Ultimate's latest offering, PSST, was released in June. The packaging shows Robbie the Robot sitting on a flower and defending it from what look like tiny Weetabix with wings and eyes.

Robbie's job is to defend the flower from interstellar space slugs, scuttling leeches and menacing midges. It is also designed to work with the 16K or 48K RAM Spectrum.

Ultimate is releasing two more games for the 16K Spectrum at the end of July. Tranzam is a high-speed pursuit race across the US.

The map is real and the playing area 600 times bigger than the actual viewing size of the screen.

Cookie is a game where Charlie the Chef and his ingredients fight off the Bin Monster and other nasties. Stamper describes it as 'incredible'.

All these retail at £5.50, including VAT. They will be available at all larger branches of WH Smith, John Menzies, Boots, and other major software retailers.

The games can also be obtained through mail order from Ultimate Play the Game, The Green, Ashby-de-la-Zouch, Leics LE6 5JU. Tel: 0530-411485.

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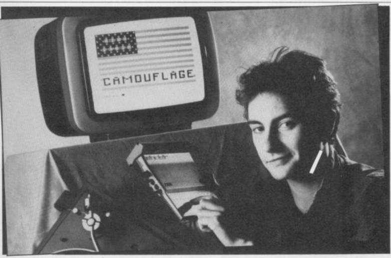


SINCLAIR POP

Who would have thought that Clive Sinclair could affect the pop music world? Chris Sievey and Pete Shelley are two musicians who have turned to his micros.

Mancunian Chris Sievey is the man behind the world's first computer-game pop single. The record was released in May by EMI, and the cassette in June. It features a song called 'Camouflage' on the A-side, and three programs for the ZX81 on the B-side.

When you play the B-side, all you hear is a series of bleeps. When you play it into a ZX81, the program will load into the computer's memory.

Once loaded, you can play the A-side. The lyrics to 'Camouflage' and various graphics will be displayed on your TV in sync with the song.

An arcade-type video game called Flying Train is also on the B-side, in both 1K and 16K versions.

With 750,000 ZX81s sold in Britain, EMI have obviously realised that the people who 10 years ago provided the biggest market for pop records are now buying computers and computer games.

'Camouflage' sells for about one fifth of the price of games cassettes. EMI hopes that Sievey's effort will 'revolutionise the music and home computer industries'.

Pete Shelley's XL1 Plus Dub Mix album is for the Spectrum. Working in one of the top computerised recording studios in this country gave him the idea of writing a program on one of his albums.

When the music for XL1 had been recorded, Shelley and a friend worked out a program for the 48K Spectrum. They put it on the last track of the album. This is loaded in a similar fashion to Sievey's record.

The album is also sold with a cassette.

'People are very scared that the music may be copied,' said a spokesman from distributor Island. 'We are not suggesting that.

'We are suggesting that they actually buy the cassette.'

The cassette was released at the end of June. It sells at approximately £5, the price varying regionally.

'We did it because the artist wanted to do it,' replied Island's spokesman when asked about future plans for more albums.

'But we would not be against doing it in the future.'

COMING – THE SCREEN PLAY OF THE BOOK

The feudal planet of Pern, its fire-breathing dragons, dragon riders, and lord holders have been immortalised in the 10 million books sold to hungry Anne McCaffrey fans.

Now the Nebula award-winner has given games manufacturer Epyx the licence to market a computer game based on her characters.

McCaffrey was in the lucky position of being able to pick and choose who should market the game.

Epyx was chosen because of 'its good track record and good distribution,' she said.

'I was approached by three or four companies, and my research indicated that it was the better one.'

More importantly, McCaffrey wanted a company that would remain true to the spirit of her books.

Her younger son, Todd, is in the US helping to design the game.

'He also helped to design the Mayfair board game,' said McCaffrey.

'He has an Atari and my older son has an Apple.

'The dragon riders and lord holders are in the game, but not all of the subsidiary characters,' she continued. 'It is still at the planning stage.'

The game will run on machines from Apple, Atari, Commodore, IBM and Tandy. It will be available in the US from November, but UK fans will have to wait until 1984.

FOLLOWING A NEW CULT

Newcomers to the software market now include Virgin, the multi-million pound music business.

Virgin is launching eight games initially. They are for the Spectrum, BBC and Vic 20 and retail at £7.95. The company promises a new approach to marketing games software, and high quality in the games themselves.

Like the rock industry 10 years ago, the computer games market now is young, huge and lucrative. Virgin is pushing its program authors as cult figures. Each cassette comes with a description of its author and a passport-style mugshot.

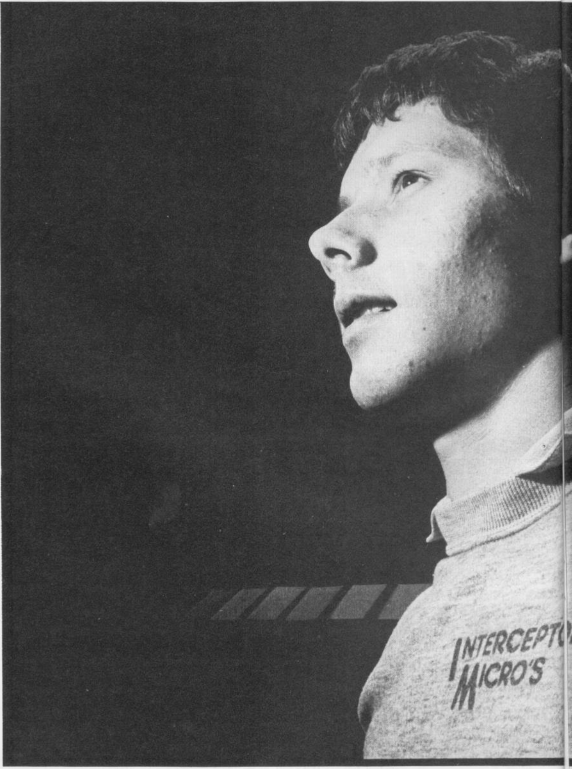
Sheepwalk is Virgin's offering from Gregory Trezise, an 18-year-old, A-level student. It is one of the best games around for the Spectrum. In it, you are a dog whose brief is to round up sheep without drowning them or destroying crops. It should be a big success.

Other Spectrum games are Yomp and Starfire, involving the now flogged-to-death themes of crossing a busy road and last-human-against-the-aliens respectively.

Our review copies had a few bugs; we hope that Virgin have managed to squash them before public release.

With each game bought before 1st September, Virgin has two freebies. The first is one year's membership of the Virgin Games Gang.

The other is music by Steve Hillage on the second side of all cassettes.


INTERCEPT
MICRO'S

INVESTMENT PACKAGE

AT 17, RICHARD JONES HAS LAUNCHED THREE SUCCESSFUL COMPANIES. DEIRDRE BOYD ASKED HIM WHY HE CHOSE THE COMPETITIVE COMPUTER GAMES MARKET

Richard Paul Jones is a 17-year-old whizz kid. He is sole proprietor of two successful computer-related companies which are building up solid profits and a solid reputation. They are expanding week by week. Then he will look for something new, another interest. He wants to make money. Paradoxically (depending on how much of a capitalist you are), he seems to be doing it with ethics.

I met him at Commodore's annual computer show in London's Cunard Hotel, where his exhibition stand was arguably the most eye-catching. Brightly coloured and fast-moving screens were generously dotted about, tempting passersby from 10 years old and up to play.

There was the old favourite, Frogger, with diving turtles and plenty of vehicles to run you down. There was Crazy Kong: 'the ape has captured Mario the carpenter's girlfriend and has taken her to the top of a steel fortress. You must get Mario to the top to save her!' Both of these were written by 15-year-olds. There was Jupiter Defender, amazingly written by an 11-year-old, Scramble and Panic.

The bunches of people around each machine were testimony to the popularity of the games. How did it all start?

Richard Paul Jones was born on 28th July 1965 in Rinteln, West Germany. His birth sign – Leo, the leader – was a good indication of the career he was to carve.

He was educated in West Germany and Hong Kong, where his father's work brought him. He then spent nine months in Northern Ireland where he studied for, and got, seven O Levels. Four A Levels were offered, but he refused them, finishing school at 15.

'My father stayed in Northern Ireland just so I could finish my exams,' Jones said. 'We returned to England at the end of June, as soon as I finished my last one.'

He then worked part-time in a hi-fi and video shop. He had the chance to get into the marketing side but had to turn it down: by law, he could not work until the end of July because he was not yet 16.

'My parents were looking for something to set me up,' Jones explained. 'I was motivated and they knew it. I did not want to work in my mother's haulage company. If I had stayed in the hi-fi shop, I would probably still be there, maybe repairing equipment.'

His father had put some money aside. Jones used it to start up a video cassette library. He had 100 tapes.

In December 1981 he moved into a shop. 'Now I have 2,500 tapes and two people working for me.

'All the takings were invested back into the company, and this is still going on. Everything earned goes back in to buy programs and pay staff.'

Jones launched the now-famous Llamasoft software company when he was 16, from the takings generated by the video cassette shop. It was a whirlwind affair.

'I decided to form a partnership with programmer Jeff Minter,' he said. 'I funded it and Jeff was to program the games.

'The way I met Jeff is that I bought – or rather, I ordered and built – a ZX81. I built mine before Jeff did; he started with a ZX80. He was good at writing programs. I was interested in games. I was a freak at that stage.

'I saw Jeff's potential. We were hobbyists. Then we bought a Vic 20 each. He really started shining – he was very much into it. We went to an exhibition, looked at magazines. And I could see the potential in his games compared to those.

'He was a bit dubious about coming in with me at first. But our partnership must have worked out. Jeff's got a thriving business now.'

Jones made the decision three weeks before Commodore's show last year, which made this year's show Llamasoft's first anniversary. He managed to get a cancelled exhibition stand on the second day, and so Llamasoft was thrust into an eager market.

'We had a stock of 80 cassettes to take to the show and sold most. The show alone cost £600. But 10 days later we had an order for £3,500 worth of games – about 600 games,' Jones said. 'I had put about £1,000 into selling the whole lot. We thought we were on to a really good thing.'

The duo bought their first piece of equipment for £1,100. They made what Jones called a 'reasonable profit'. This again went back into the company. Things continued in this fashion from June to September 1982.

Then unexpected troubles began.

Jones had been doing all the marketing and administration. But his 50% share in the company meant that Minter had to be consulted on every one of his decisions. For an individualist like Jones it felt like a frustrating straightjacket.

He had been placing advertisements for programmers. They came in with some extremely good demonstration tapes, which he wanted to market. But Minter refused to deal with them, wishing to remain Llamasoft's sole programmer.

The split was inevitable. 'We were incompatible,' Jones said. 'He thinks I am a capitalist.' That was September of last year.

Jones remains loyal to Minter's skills. 'Jeff has quality. He is a fantastic programmer. He is a classic example,' he praised. 'I don't feel that way: I just feel I am giving value for money. Certainly, the quality of my games has gone up and up and up. People think the software is as good as Jeff's, but not better. The advantage is in the packaging and marketing.'

The split was followed by two months of research as Jones investigated how to set up the company he wanted. 'This involved going back to the stuff I was sent when with Llamasoft and contacting other people, too.

'EVERYONE GETS PAID WHAT THE PROGRAM IS WORTH. I HAVE NEVER RIPPED ANYONE OFF.'

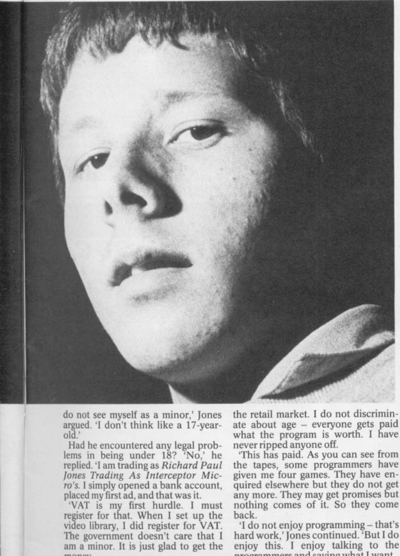
CRAZY KONG
INTERCEPTOR SOFTWARE

Some stuff was good, some not. Obviously I have my own authors now,' he said.

Not one to be inactive, the two months of research were also spent independently developing a joystick for the Spectrum.

He named the new company Interceptor Micro's in December 1982. 'I placed my first ad, a full page. I spent £500 on that ad. I made a profit. I placed more ads. Now I place spot-colour ads in four monthlies. And I will use full colour later on.'

The professional attitude to marketing seems strange from someone still at an age when most are at school. 'I do not see myself as a minor,' Jones argued. 'I don't think like a 17-year-old.'



Had he encountered any legal problems in being under 18? 'No,' he replied. 'I am trading as *Richard Paul Jones Trading As Interceptor Micro's.* I simply opened a bank account, placed my first ad, and that was it.

'VAT is my first hurdle. I must register for that. When I set up the video library, I did register for VAT. The government doesn't care that I am a minor. It is just glad to get the money.

'I have a legal contract for all purchases of copyrights. I am well covered. Anyway, most of the programmers are younger than me.'

As with all his previous enterprises, Jones invested any money made from Interceptor Micro's back into the company. 'In November I had only two games. Now I own the rights to 21 or 22 programs – world marketing rights. Six programmers are working from home. Some are students: the youngest is 11. My best selling game, Jupiter Defender, is written by him. The oldest programmer is in his 30s. He is a police officer. He bought an Atari for his leisure, created a game and sold it to me.

'I look at the games, see their potential. I work out what each is worth on the retail market. I do not discriminate about age – everyone gets paid what the program is worth. I have never ripped anyone off.

'This has paid. As you can see from the tapes, some programmers have given me four games. They have enquired elsewhere but they do not get any more. They may get promises but nothing comes of it. So they come back.

'I do not enjoy programming – that's hard work,' Jones continued. 'But I do enjoy this. I enjoy talking to the programmers and saying what I want.

'I may want a version of Panic, which is already in the arcades. The programmers rough an idea. I smooth the edges, so to speak, and come up with a marketable product. If I felt it was not value for money I would not market it.

'I have only recently put my own name on the covers of the games, under the programmer's name. Usually, I star the programmer. Most other people show their company, and do not advertise who wrote the game. Programmers appreciate recognition when they write a program.

'I have a secretary, called Carol. She is 18. At the bottom of all our ads, I have inserted "Any problems, ring Richard or Carol". So Carol gets some recognition, too. And her name is at the bottom of the letterheads as being the secretary.

'I think I am probably one of the only companies in England selling stuff and not making the profit everyone else is making. This is because I am spending so much money on packaging – not so much advertising, but the actual packaging. "Why are you packaging like EMI Video?" people ask me. Even the type of case I use – instead of using ordinary cassette cases, I went for a special video cassette package which is costing three times as much. But I am charging less than most.'

A quick look at Interceptor Micro's programs shows the truth of Jones' last remark. Six of the games for the Commodore 64 are £5, the remaining seven £7. And games for the Vic 20 range from £4 (for Frog) up to £6.

'Most of the art work I supply. I go independently to people who may be my age. I put feelers out. If someone comes up with a good thing, I pay for it,' Jones said.

The covers of Sprite Man and Panic were drawn by the sister of A. Challis (Jones never reveals the christian names of his authors), who wrote Frogger. 'Their parents think it is the best thing they have seen,' Jones enthused.

'I do my own packaging, my own duplication. When I broke with Jeff, I took the copier. Now I have another system which produces 300 copies in one hour. I do all this myself: I employ a full-time person who works 40 hours a week duplicating. I try to keep everything inhouse: copying, advertising, duplication.

'I seem to be giving too much back to the customer. I have been told I am an idiot. "Why charge £7 when you know it is worth more? The games are better than some others." I am too soft on the customer. But that will build up a good market share. They all come back.

'Someone – say a schoolboy with £5 per month pocket money – may order just one cassette. His father may send the actual cheque. Then a few weeks later I get another order from the same person. He's saved up his pocket money again, to buy another tape. A lot of other people do not have this loyalty. Their games are expensive, 'MONEY CANNOT BUY PROGRAMMING SKILLS BUT IT HELPS. IT BUYS THE EQUIPMENT TO DEVELOP THOSE SKILLS'

and some users feel they have not got their money's worth.

'I do not reckon it is the best software in the world,' Jones deprecated. 'But it is value for money. I do not market rubbish – it would ruin the name I am building now.'

The company is getting to the stage where even Jones' parents are helping out. His father is working on the exhibition stands this year. 'I need more staff because I cannot cope,' Jones said. 'The market demand is growing so quickly. The people that were small – wholesalers, etc – and ordered small quantities from me are now ordering more because they have grown. The shops are sold out of cassettes almost as soon as they appear. Which is good, really.'

Commodore itself has got into the act. It is currently advertising seven of Interceptor Micro's games in VicSoft, Commodore's Vic 20 user catalogue.

'Frogger is just for the UK market,' Jones said. 'They are all arcade clones, arcade rip-offs. They are a problem because you cannot sell them in the US where copyright rules are stricter. I am selling Puckman, for example, on Atari's Pac Man advertising.

'Because I cannot find an international market, I am bringing out more original software. At the moment, I can only sell in the UK. When I showed Frogger 64 at a computer show in America, I was told to turn it off immediately. The dealers were afraid of a law suit if they showed it for even just a few minutes. "Come up with original software, or we can give you ideas to develop into games," they said.

'Jeff is now writing for an American company. They are using English brains because he is the best. Now they are looking at my stuff, which is coming up to the same sort of standard. But it is not the right sort.'

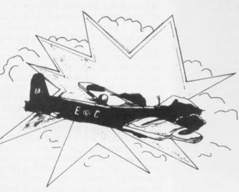
Jones is looking for a freelance machine-code programmer 6502 or Z80. 'I feel there are many people out there as good as Jeff if only they could be developed right. There are people who are as good – or better – than anyone else in the world. But they do not have the equipment, the facilities. Money cannot buy programming skills but it helps. It buys the equipment you need to develop those skills.

'As far as wages go, the only thing I have had from the company is my trip to America. I do not take a wage. I don't take a wage from the video shop, either. I probably live on £20 a week – sounds ridiculous, doesn't it? I don't drink, I don't smoke, I don't socialise.' He paused. 'Well, not much.'

'My prime interest in life is to make money. Maybe I will retire early. I am a weird sort of character. I have just come back from Florida and Chicago, where I saw the Consumer Electronics show. I found more enjoyment walking round Chicago, which is a grotty place, than having a rest on the beaches of Florida or going to Disneyworld. That's because I am fascinated with electronics. It is not work to me.

'I would like to retire at 25. If you have enough money you cannot get bored. People say that if you are rich you are unhappy. But if you are poor you can be unhappy, too. I would probably still own the businesses, even when I have retired.

'I see my role like that of a bloke who runs a record company, except I don't rip people off. I could have been stingy – bargaining with programmers, being mean with the packaging – and made more money. But I would not have their respect.'



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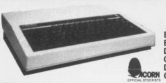

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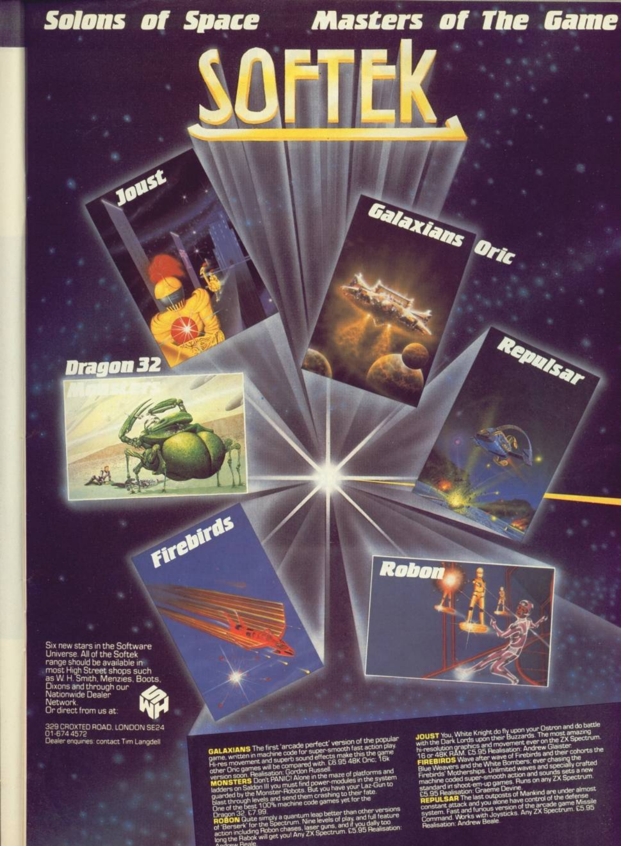

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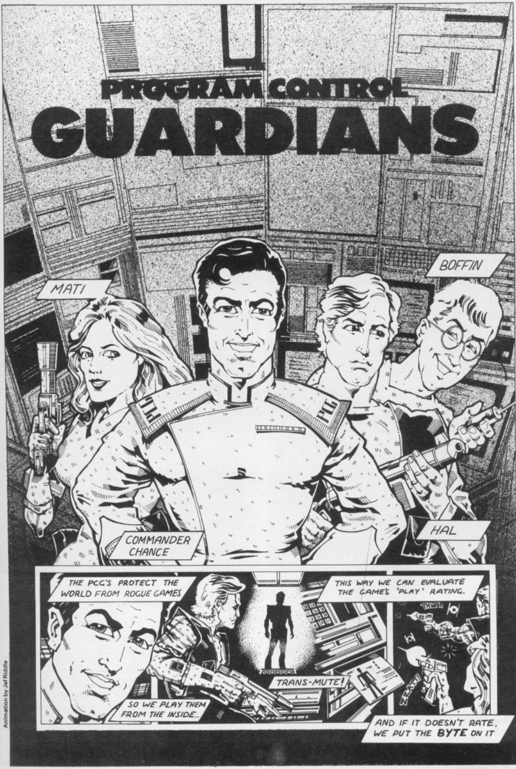
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P.C.G.1

GET CRACKING!

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Beat the software houses at their own game and write an original graphics adventure.

Programming for computer games is improving by leaps and bounds. Every machine plays games written not just by software houses but by users from nine years old upward. But there are now so many games about that the producers seem to be running out of ideas. Soon the success of a game will depend on the design underlying it rather than programming skills.

After a wave of Froggers, Flight Simulations, Pacmen and Donkey Kongs, the software houses are turning to the classics for inspiration. Adventure games are centred round Tolkien's *The Hobbit*, Carroll's *Alice in Wonderland*, even good old Dragons and Dungeons.

So here is a competition open to all our readers, whether you have programmed before or not. Let your imagination go wild and write an adventure. DON'T base it on a book or Dragons and Dungeons. The more tortuous and twisted it is, the better. Touches of humour are always appreciated. If there should be a tie, the adventure with the most detail will definitely have the edge.

The reward for the best adventure is a CGL M5 Home Computer worth £190. Newly released, the CGL M5 home computer package gives you everything you need to start playing immediately.

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The CGL M5 has a Z80A CPU (3.58 mHz), 20K RAM (16K V RAM) expandable to 52K and 16K ROM expandable to 24K. But its graphics and sound make the M5 ideal for games enthusiasts.

The animation is jitter-free and the graphics on a par with the arcade machines. The sound incorporates a 'mini-synthesizer' which can give you three separate voices with six octaves.

All entries must arrive at the following address by 31st August 1983: The Editor, *Personal Computer Games*, VNU Business Publications, 62 Oxford Street, London W1A 2HG. The judges' decision is final and no correspondence will be entered into.

The Autumn issue of *Personal Computer Games* will feature the winning adventure. And we will be offering another super prize to the reader who comes up with the best program for it.

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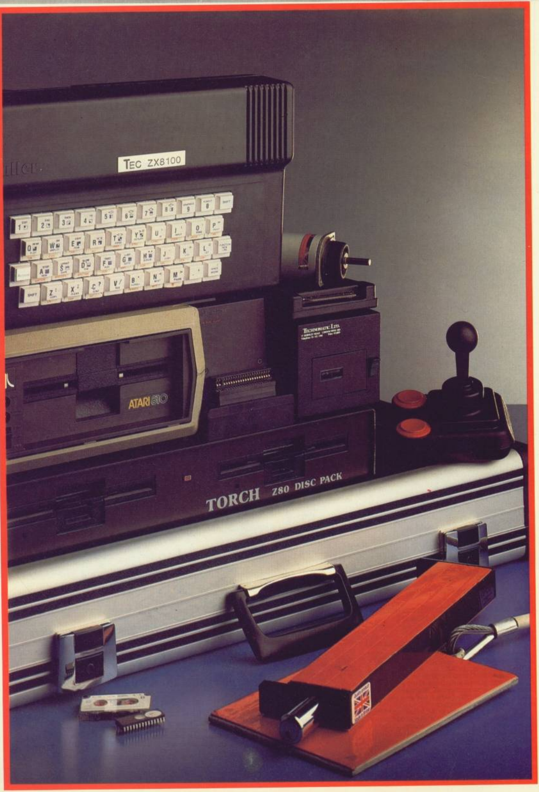
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SPECIAL
REVIEW
18

BOOSTERS

PERIPHERALS CAN BOOST YOUR MICRO'S POWERS AND YOUR FUN. TONY HARRINGTON HAS SCOURED THE SHOPS FOR YOU

There seems to be a new microcomputer on the market every week. But that is as nothing compared to the rich growth now taking place of computer peripherals of all kinds.

You may want the freedom of a joystick for reflex-type games. Or you may want additional memory or processing power. In every case, there is bound to be at least half a dozen suppliers eager to offer their wares.

The ideal way of doing a peripherals round-up is to group what is available for each brand of home computer. But many suppliers offer add-ons for more than one kind of micro, so the list becomes repetitive.

In the first of our series of peripherals, therefore, we have listed the suppliers. The names of the micros are highlighted when the peripheral concerned is specific to a particular machine.

First in our list is Flight Link, which is based in Alton. It makes three ranges of joystick, suitable for a wide range of micros. The first model in the range is the J1. This has dual axis carbon track controls and comes with or without cases, switches and cables.

The second, JS2, has high-quality, all-metal dual controls. At the top end of the range, which will be outside the pocket of most micro-enthusiasts, is the JS4. It has inductively coupled contactless joysticks.

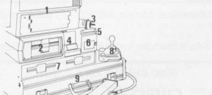
This firm takes the business of making joysticks very seriously. It pays a lot of attention to unique demands, such as the control of puppets or the movement of vessels under water. Its products range in price from £3 to a staggering £1,000.

Akhter Instruments, based in Harlow, also has a range of peripherals. In particular, there are three types of green monitors: the Hitachi MM1216 at £102.35; the SM12H 18MHZ monitor at the same price, and the cheaper, if less powerful SM12N 15MHZ at £79.35. All prices include VAT.

The company also offers 14-inch colour monitors whose prices range from £239 plus VAT for the normal resolution of 400 dots up to £499 plus VAT for the high-resolution 800 dots screen.

SIR Computers, from Cardiff, supplies a Z80 disk pack for the BBC Micro at £895. That sounds steep, but the system aims to be a sophisticated development of the machine's potential.

It connects to the BBC micro in the same way as a normal disk drive. It then opens up the whole range of CP/M software for business and dataprocessing as well as games. This is because the firmware supplied with the machine allows you to switch between Basic and CPN, an operating



Key. 1: ZX81 keyboard. 2: Atari disk drive. 3: Flight Link joystick. 4: Sinclair 16K RAM pack. 5: Dragon 32 sound module. 6: BBC Hobbit storage unit. 7: BBC disk pack. 8: Kempston joystick. 9: Spectrum microcase. 10: Securit anti-theft device.

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3. ARROW OF DEATH (Pt. 1) — A blight has fallen on your homelands, the Baton has become tarnished and now radiates a malevolent aura of Evil. Your mission is clear — trace the source of this Evil and destroy... or be destroyed. This is the first part of an Epic Adventure although each part can be played as a stand alone scenario.
4. ARROW OF DEATH (Pt. 2) — You now have the means to destroy your enemy... but you are far from home and this land is strange to you. Can you cope with the deadly perils which approach you and have you the strength to see your mission through to the final conflict?
5. ESCAPE FROM PULSAR 7 — Alone on a gigantic Space-Freighter... The rest of your crew have died horribly at the hands of a mutated Zoo-Specimen. Your only chance of escape is to reach the Frail Shuttlecraft. But the lurking Monster is hungry and you are the only food it has left...
6. CIRCUS — Your Car has run out of Petrol on a lonely road miles from habitation. As you trudge reluctantly down the road in search of help you are suddenly confronted by an amazing sight... In a nearby field is a Huge Circus tent! But this is no ordinary Circus as you will soon discover..
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10. NEW TEN LITTLE INDIANS — This mystery begins with a train journey into a strange country. What secrets are held by the strange country mansion? What meaning is attached to the strange idols? Maybe you will find out if you live long enough...

Each adventure comes attractively packaged for just £10.29 inc.

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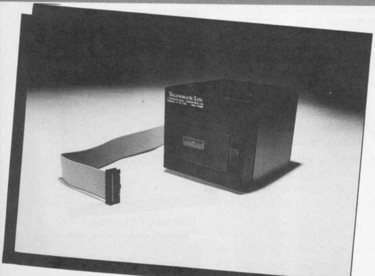


The Hobbit is a memory storage device for the BBC

19→

system developed from CP/M 2.2.

The disk pack also, of course, provides a dual 2 x 400K disk drive for use with the standard BBC Basic. The machine is able to run CP/M because it includes a Z80A processing card with its own 64K RAM card, which communicates with the 6502A in the BBC computer.

The supplier claims that, in most cases, the speed of execution of programs is improved by up to 50% compared to conventional single processor computers.

Computer Concepts has had considerable coverage for its Wordwise ROM-based word processor for the BBC micro. The price is £39 plus £1.50 for postage and packing; VAT is on top of that. The 'chip' plugs into one of the empty sockets inside the machine.

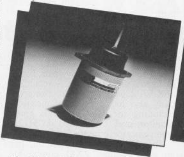
It is supplied with a spiral-bound manual and a cassette which contains an example document and a free Typing Tutor program.

Basingstoke supplier Fox Electronics offers the Vixen RAM cartridge for the Vic 20. This cartridge is switchable between 16K or 8K and 3K. It plugs into the rear expansion port and should be fully compatible with all motherboards and modules. No readdressing of existing Basic programs is needed. The price is £39.95.

The same supplier also offers a 42-key travel keyboard for the Spectrum. You are supposed to be able to remove the ZX printed circuit board from your Spectrum and simply screw it down into the keyboard case. The supplier promises that no soldering is required. This costs £31.95, including postage and packing.

There is also a ZX-Panda 16K RAM pack for the ZX81. This is expandable to 32K with a plug-in module from the same supplier. It includes a LED power indicator and is designed to connect without risk of the wobble that plagued the early Sinclair RAM packs. Prices range from £19.95 to £46.00 including postage and packing.

For users who don't like the standard ZX81 keyboard there is a replacement keyboard with a calculator-type design. This is a stick-on replacement and is priced at £9.95 from Filesixty.



The Flight Link joystick

Those of you who are being slowly blinded by the glare from your TV set being used as a monitor might like to try out the effects of antiglare screens. Merseyside firm Datatel Business Products offers a range of antiglare screens which give a sharper, clearer image and cut down eyestrain. The price is £19.95 plus £1.80 for postage and packing.

Datatel Business Products also makes a multi-purpose computer stand which has an all-steel construction. This comes as a self-assembly kit and there are two sizes: two foot and two-and-a-half feet in height.

KK Electronics, of London, has a range of colour monitors compatible with the BBC, Lynx, Oric, Acorn and all other computers with RGB.

The monitors have a 16-colour display plus a brightness control. There is also a quality sound amplifier with loudspeaker control. Prices start at £239.95, plus VAT.

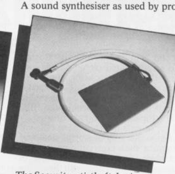
A speaker which plugs into the microphone socket of the Spectrum and boosts the sound output is sold by Alan White, of Poole. The speaker comes complete with volume control and needs no soldering. It costs £5.50 inclusive of postage and packing.

If you are worried about thieves making off with your home computer, you can at least ensure that they have to go to the trouble of taking the table with them, thanks to a little device from Ofco Ltd.

Called Securit, the locking device fixes to the desk top without the need for any holes being drilled. It costs £29.95 plus VAT.

More and more games designers are adding complex sound routines to their offerings. But for those Dragon owners who reckon that the sound of their machines still lacks a little, JCB Microsystems offers the Sound Extension Model for the Dragon 32. The price is £34.95 including VAT.

The sound extension model looks much like an ordinary games cartridge and plugs into the Dragon's expansion port. Based on the AY-3-8910 sound chip, the module adds an extra command called MUSIC to Basic. The range of possible sounds is specified as numbers and characters.



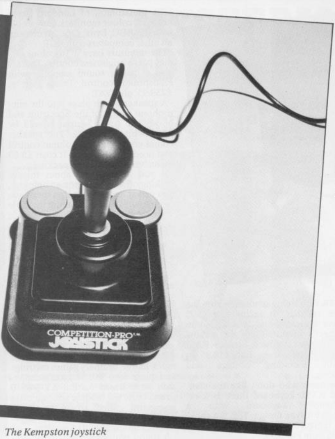
The Securit anti-theft device

A sound synthesiser as used by professional musicians this is not. For the price, you wouldn't expect it to be. But it will produce a creditable set of tunes and a variety of games noises from wailing sirens to bomb blasts.

The novice computer user will probably not have his (or her) machine long – and will run only a few programs – before the need for more memory becomes apparent. The BBC Model B, for example, has excellent ROM facilities, but has used up quite a bit of its RAM space accordingly.

BBC Micro users after more storage will find the quaintly named Hobbit tape system worth a look. Made by

→22



The Kempston joystick

32K| CHEETAH

The Cheetah RAM pack

The Micro Aid case

21→ Ikon Computer Products, the device operates as a sort of half-way house between cassette and disk-drive storage media.

It comes in two parts: a cassette unit and an integrated circuit which contains the tape operating system to drive the Hobbit. This last comes as a ROM card which has to be inserted in one of the three sockets in the BBC before the cassette unit can be used.

It represents a faster, more efficient and effective way of storing data and programs than conventional cassette recorders. And it has a number of commands which deal with the saving and loading of data.

The Hobbit cassette unit is about three and a half inches wide, roughly the same in height, and four inches deep. It weighs two pounds. Four large rubber pads on the base ensure that the equipment stays on the table instead of skittering off onto the floor.

The device has a data transfer speed of 750 bytes of data a second, five times faster than ordinary cassettes. The price is £135 plus VAT.

Kempston Micro Electronics has a joystick named the Competition-Pro for the ZX Spectrum. It is a nylon and steel construction, with a self-centering stick and two fire buttons. It plugs into the Spectrum expansion port. You can buy it at WH Smith branches for £25 including VAT. The same supplier has joysticks for the VIC 20 and the Atari 400 and 800. They come at the somewhat cheaper price of £16.50 including VAT.

Microcell Computer Systems, based in Leeds, advertises the Sinclair ZX 16K RAM pack at £28.50. The company also has a range of monitors including the BMC BM12E green monitor and the Sanyo SCM12H green monitor, both for £100.

Cheetah Marketing, London, has an even cheaper ZX81 compatible RAM pack at £19.75 and the 64K RAM pack at £44.75. Both prices include VAT and postage and packing.

Warrington firm Micro Aids has thought up a way of allowing keen Spectrum users to take their machines with them wherever they go. The Spectrum/ZX81 microcase is designed to hold the computer, power supply, printer and rampack, with space left over for a cassette recorder or the fabled Sinclair micro drives.

The supplier advises that the shallow tray which contains the case can be used as an attractive desk-top console. And the detachable top of the case could be used as a TV stand. The price starts at £29.95, including VAT.

The Harrow-based firm, Home Entertainment Centre, has a number of add-ons for the Atari 400 and 800. In addition to joysticks at £14.95, there is a keyboard at £79.95, a 48K expansion at £99.95 and a disk drive at £289.99.

If you have wanted to make your micro talk back, the Namal Supertalker is a useful extra. It comes from Namal Associates in Cambridge. Priced at £89.95, it has an extensive built-in ROM/RAM dictionary and a standard RS232 interface.

It will run on a number of different micros. And as it is a phoneme synthesiser, it is not limited to particular words. It has been designed around the Votrax SC-01A phoneme speech synthesiser chip. You create words by using a sequence of codes to build words out of component sounds.

Up to 200 to 250 new words can be dumped into the device's RAM to add to the 550 high-usage words already stored in ROM. Special versions are available for the ZX81 and the Spectrum. These versions are memory mapped. In compensation, the price for these two models is £49.95, including VAT.

The Hobbit, ready to load

Finally, Hendon-based Vulcan Electronics offers the Spectravideo Quick Shot joystick. Similar to a helicopter joystick, it enables you to control and fire at the same time, with one hand. It has a rapid fire button on top of the handle. And there is an optional left-hand fire button at the base which can be used simultaneously.

As the Quick Shot comes with four suction pads, there is no need to hold down the base.

The Quick Shot joystick can be used for the Atari VCS system, Vic 20, Commodore 64 and Atari 400/800. It costs £11.95 including VAT.

USEFUL ADDRESSES

If you would like to know more about the products mentioned in this review, you can contact the manufacturers at the following telephone numbers. Addresses are supplied where no number is available.

Akhter Instruments, Harlow	(0279) 412639
Cheetah Marketing, London	(01) 240 7939
Computer Concepts, Chipperfield	(09277) 69727
Datatel Business Products, Merseyside	(051) 334 6369
Flight Link, Alton	(0420) 87241
Fox Electronics, Basingstoke	(0256) 20671
Home Entertainment Centre, Harrow	(01) 861 0036
Ikon Computer Products,	(099421) 515
JCB Microsystems, Poole	(0202) 423973
Kempstone Micro Electronics, Bedford	(0234) 852997
KK Electronics, London	(01) 317 1486
Micro Aids, Warrington	(092) 576 2613
Microcell Computer Systems, Leeds	PO Box MT12, Leeds 17
Namal Associates, Cambridge	(0223) 355404
Ofco, London	(01) 981 7301
SIR Computers, Cardiff	(0222) 21341
Vulcan Electronics, London	(01) 203 5161
Alan White, Poole	(0202) 682867

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PCG7

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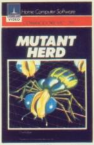
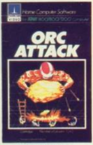
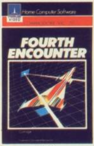

Home Computer Software
MUTANT HERD
VIC 20


Home Computer Software
ORC ATTACK
ATARI 400/800/1200


Home Computer Software
FOURTH ENCOUNTER
VIC 20

Home Computer Software
RIVER RESCUE
VIC 20/ATARI 400/800/1200

SUBMARINE COMMANDER
VIC 20/ATARI 400/800/1200

VIC MUSIC COMPOSER
VIC 20

ATARI 400/800/1200

JUMBO JET PILOT
ATARI 400/800/1200

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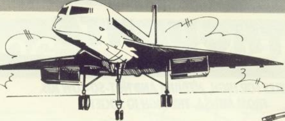

The figures on the arrivals/departures board at Outer Thisworld Airport represent the exact mileages of Concorde, based at the airport, from the relevant destinations.

Our jet has a problem regarding its staying power. It can only travel 1,000 miles on a full tank. Can you work out the different combinations of cities Concorde could visit…using every drop of its fuel each time? And remember, due to customs restrictions in Outer Thisworld, Concorde must return to base after visiting one city and before leaving for the next during each 1,000 mile trip.

Answer on page 112.

FLIGHT INFORMATION

CAIRO	700
PARIS	376
NEW YORK	150
LONDON	188
SYDNEY	624
ATHENS	168
PISA	586
ROME	150

THOUGHTS

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This thousand-fold magnification of a silicon chip is actually divided into sixteen rectangular sections of equal size.

But there the similarity ends, for only two of those sections actually convey the same information – which they do by carrying the same six symbols, possibly in a different order.

Which are the two 'identical' sections?

	A	B	C	D
1	○ □ △ △ △ ○	● □ ● △ □ ●	○ ○ ▲ ▲ ○ ▲	□ ○ △ △ □ ○
2	△ ○ △ ● △ △	■ ○ △ ○ ○ ■	○ ● ■ △ □ ▲	■ □ ■ ○ △ ■
3	○ ▲ ▲ ▲ ○ ●	○ □ △ ○ □ ○	■ △ ■ △ ○ ■	□ ▲ □ ▲ □ ●
4	□ ● △ ● △ □	■ ○ ○ ■ □ ○	▲ ● ▲ ▲ □ □	▲ □ △ ○ ● ■

Answer on page 112

At last! A joystick that works!

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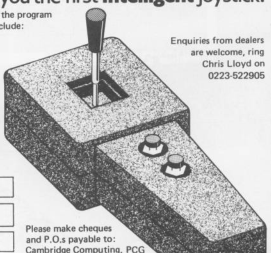

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All M/C version of SCRAMBLE

KB/JS VIC 20 Unexp. £5.95

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Super games pack for younger children with bright colour graphics and sound effects. Everybody's favourite Simon plus Super Snap, O's and X's, Word Jumble, Bomber, Duck Shoot and Mad Drivers.

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KB VIC 20 Unexp. £5.95

PHARAOH'S TOMB

Once you enter, the only way out is with the aid of a key which unlocks the mystery of the Pharaoh's tomb. Beware of the mantraps the ancient Egyptians so painstakingly built. One false move and you will meet the same fate as befell other tomb robbers over thousands of years. A multi-screen big graphical adventure with M/C movements.

KB VIC 20 16K £5.95

ZOK'S KINGDOM

Your starcruiser badly damaged in a meteor storm is forced to crash land on the planet ruled by ZOK, a time space generated image of Dracula. You are challenged to a battle of wits and endurance as the battle for survival starts in earnest in this big multi-screen graphical adventure in hi-res graphics and M/C movements.

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Popular arcade game. All machine code with brilliant colour graphics and sound effect. Features include snakes, crocodiles, lady frogs, turtles, cars, lorries and logs.

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JS VIC 20 16K £7.90

SLAP DAB

An exciting game based on the arcade game PAINTER which combines fast action with strategy. Giant insects hiding under the old paint surface are released by your paint brush. You require fast action and quick thinking to outwit them and finish the panel. The game is 100 percent machine code and HI-RES. graphics also includes HI-score and running score with brilliant sound effects.

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CRAWLER

All M/C version of Centipede

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3D TIME TREK

At last a 3D game for the VIC! Although badly wounded, you are determined to seek and destroy the marauding space pirates who have now dispersed around the galaxy in search of fresh prey. A brilliant Startrek game with a difference — spectacular 3D graphics and real arcade actions.

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KRAZY KONG 16k
MINI KONG

MINI–KONG

For UNEXP from the writer of Krazy Kong comes the equally brilliant Mini-Kong. You will wonder how he managed to cram so much in the unexpanded VIC.
Brilliant multi-colour graphics, expanded screen, lift, rolling barrels, ladders, running score/HI-score and not to forget the hand bar bonus in this all M/C presentation.

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KRAZY KONG

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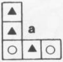
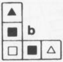
THOUGHTS

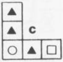
The computer print-out below contains some sort of logical reasoning as to the positioning of the various symbols.

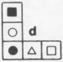
Without the correct, vital missing piece the computer malfunctions and orders you 20 King Prawn Balls from the local takeaway instead of booking two weeks for you and your mother in the Seychelles.

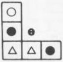
No doubt some would be more than tempted to insert the wrong piece and get a liking for Chinese food in great quantities, but can you work out which piece logically fits into the gap anyway?











○	■	■	○	○	○	□	○	○	■	■	△
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Answer on page 112.

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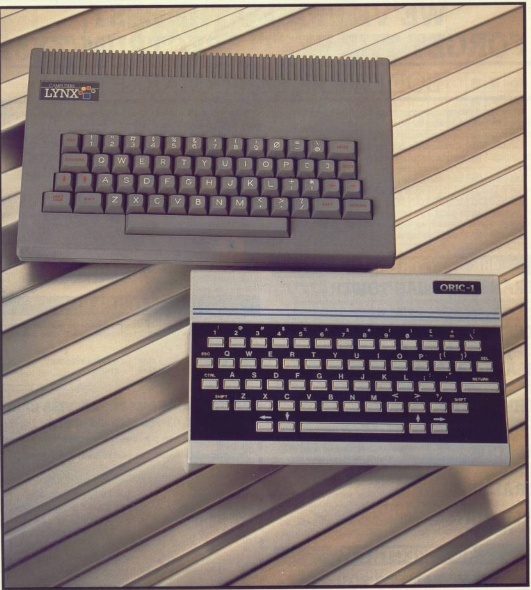
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MAKING MICROWAVES

LATEST MICROS INCLUDE A SERIOUS RIVAL TO THE SPECTRUM AND A HIGHLY UPGRADABLE HOME COMPUTER. STEVE MANN AND MAGGIE BURTON REVIEW THE ORIC AND THE LYNX

The appearance of the Oric-1 has demonstrated once again the almost comical inability of British micro manufacturers to launch a new machine properly. Funded by British Car Auctions and using the considerable experience of Tangerine Computers, the Oric is aimed at the fastest-growing sector of the micro market: the sub £200 home computer.

The delivery difficulties that dogged both the BBC micro and the Sinclair Spectrum should have alerted Oric to the pitfalls ahead. But the new company observed its rivals' mistakes, then promptly repeated them.

As a result of this short-sightedness, reviews have already appeared in some magazines that will have dissuaded a large number of prospective purchasers from buying. These reviews have contained wrong information and have failed to mention any of the Oric's strong points. This is no reflection on the journalists involved – there is no way they could have done a proper job with the material.

A BASIC ASSET

First of all, let it be said that the Oric-1 represents extremely good value for money. It is a 16k colour and sound machine, with Centronics printer interface and RGB monitor socket fitted as standard. The price? Under £100.

I suspect that most people will go for the 48k version. At £170, it is slightly dearer than the 48k Spectrum. Indeed, it seems inevitable that the Spectrum will be Oric's main rival.

In our review machines ROM chips were not fitted; instead, there were two EPROMs. All references to 'ROM' in this review should take this into account.

Measuring 280 x 175 x 52mm, the Oric weighs in at 1.1kg. The keyboard has 57 keys, described as possessing 'tactile feedback'. They are a sort of halfway house between a full keyboard and the Spectrum 'dead flesh' keys. The keyboard is considerably less cluttered than the Spectrum's, with a maximum of two functions per key. The cursor control keys are sensibly arranged on either side of the space bar.

On power-up, the display is in TEXT mode with the caps lock on. This is important as all keywords and variables must be entered in upper case. Any attempt to user lower case is met with '?SYNTAX ERROR'. Variable names can be of any length, but only the first two characters are recognised. Great care must be taken when choosing variable names as the Oric is fussy about what it will accept.

Despite the fact that only the first two characters are significant, reserved words anywhere in the variable title will stop execution of the program. Unfortunately, there are a lot of reserved words, and the characters that make them up occur in many descriptive names. You cannot have a variable called 'SCORE', for example, as that contains the Boolean operator OR. TO crops up in 'TOTAL'. And it is all too easy to overlook combinations including ON, AND, IF. The manual is reticent on this subject. It warns against the use of 'PIG' or 'PIPES' as they both contain PI, but then gives 'JONI' as an example. This contains the reserved word ON and thus doesn't work. This will prove irritating.

The Oric uses an extended version of Microsoft Basic. Unlike the Sinclair dialect, this does not use 'tokenised' keywords. All these have to be entered in full.

This Basic is an extremely good implementation, with features not often found on more expensive computers. As on the Spectrum, computed GOTOs and GOSUBs are supported. A line like GOTO A*100 is quite in order, assuming you have given A a value earlier in the program.

Structured programming purists will be glad to see that you can GOTO or GOSUB a label. Define COUNT as, say, 500 and you can quite happily GOSUB COUNT at any time. This makes renumbering of a program considerably easier. You simply change the initial value assigned to the subroutine, rather than going through the whole program line by line.

A word of warning to Sinclair users, however. The Oric requires you to hit line numbers exactly. On the Spectrum you can GOTO 499 even if there is no such line; execution will continue from the next line. On the Oric this will halt the program.

Generally, the Oric Basic has more to recommend it than Sinclair's version. Other commands supported by Oric, but not by the Spectrum, include REPEAT ... UNTIL, DEEK and DOKE, CALL, DEF USR, FRE, IF ... THEN ... ELSE, LOG, ON ... GOTO/GOSUB, SPC, TRON and TROFF. There are a few more that apply to HIRES mode only and are thus not strictly comparable.

In addition to TEXT mode, there are three modes for graphics on the Oric: LORES0, LORES1 and HIRES.

For low-resolution graphics, TEXT mode can be retained. Or you can select either of the two LORES commands.

COLOUR SPLASH

Screen resolution is theoretically 28 lines of 40 characters. But in most cases the far left column cannot be used as it contains the attribute controlling the background colour for each row.

Colours can be set globally, using Sinclair-style INK and PAPER commands. They can also be set locally by POKEing or PLOTting attributes onto the screen. If colours are set globally, you should note that INK and PAPER will change the whole screen instantly, without a CLS command.

When POKEing or PLOTting on screen, take care that codes are entered at a blank area of the screen. Failure to do this will mean that any character already there is overwritten and replaced by a space. When working in LORES0, the alternate characters can be accessed by using PRINT CHR$(9) and the standard set regained with CHR$(8).

In HIRES mode, the screen is divided into pixels with a resolution of 240 x 200. You are not limited in the number of colours displayed, and the Oric gives more flexibility than does the Spectrum in changing colours. Each attribute will work on an area one character square in width by one

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pixel in depth. So you can have 200 lines of alternating colours down the screen.

The definition is generally very good, with each colour sharp and distinct. Characters can be plotted onto the high-resolution screen using CHAR. And there is provision for three lines of text to be entered at the bottom of the screen.

Drawing is simplicity itself. Move the cursor to the relevant place with CURSET followed by the pixel coordinates and what is described in the manual as an 'FB' number. 'FB' stands for foreground or background, and thus lines or points can be plotted or erased.

Relative moves are handled by CURMOV, which has the same syntax. CIRCLE draws what should be a circle but appears to be an ellipse.

Oric supports eight colours. The advertisements rather misleadingly claim 16 but this just means eight foreground and eight background.

USER'S FRIEND

There is only one level of brightness. Against this must be set the fact that the Oric is extremely flexible in dealing with text formats. Characters can be normal or double size, flashing or steady. And this is achieved with a minimum of fuss by using the CTRL key.

It is easy to define your own characters, using either the standard or the alternative character set. Characters are unusual in that they are defined on an 8 x 6 grid, with the leftmost two columns always being blank.

For anyone used to the weedy BEEPs produced by the Spectrum, the Oric's sound facilities will come as a revelation. In addition to the arcade-style, preprogrammed noises such as PING, SHOOT, ZAP and EXPLODE, the Oric has three tone channels and a noise channel. You can manipulate the latter to produce effects that are limited only by your imagination. With a range of six octaves, some impressive music can be obtained.

Sound generation is controlled by the MUSIC, SOUND and PLAY commands. The output is defined with MUSIC and SOUND and the envelope by PLAY. The envelope determines the 'shape' of the sound, so you can decide whether it starts sharply like a guitar or smoothly as on an organ. There are seven shapes which can achieve some stunning effects.

The sound commands are relatively complex but the results are well worth the time and experimentation.

Volume can be set in SOUND and MUSIC statements in the range 1 to 15. One thing you have to remember is to include a PLAY 0, 0, 0, 0 program line – otherwise the last note played will continue indefinitely.

Sound is definitely one of the Oric's strong points. It is not on a par with the BBC machine. But it could well be a deciding factor if you are hesitating between buying an Oric or a Spectrum.

To conclude, the Oric is an extremely good machine and one that represents extraordinarily good value for money. There is no doubt that it will prove to be a strong rival to the Spectrum in what is an extremely competitive sector of the market.

That said, I think the Spectrum may be a better machine for an absolute beginner. The graphics facilities are easier to handle on Sinclair's machine and the Spectrum manual, though far from perfect, is more helpful than Oric's. Sinclair's tokenised keywords are also probably easier for the beginner.

There are some glaring faults. In each of the four models I looked at, EPROMs were installed instead of ROMs and the Basic contained some annoying errors. I had assumed that these would be corrected before the machines were sent to customers. But it appears that some Orics have been sold through the Spectrum (no relation) retail chain. Presumably Oric will replace these faulty models – under the Sale of Goods Act, the customer is entitled to either a new machine or money back.

When the present bugs have been dealt with, and if Oric rewrites its manual to a higher standard, then the Oric- 1 should become a best-selling success. **SM**

Top: the Oric-1 keyboard is less cluttered than the Spectrum. Left: space-age profile and handy tilt for typing. Above: RGB socket and Centronics interface built in.

WHAT WILL IT COST?

Oric 16k	£99.95
Oric 48k	£169.95
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TECHNICALITIES

Processor:	6502A
RAM:	16k or 48k
ROM:	16k
Keyboard	57 key, tactile feedback ASCII, auto-repeat
Screen	domestic TV, provision for RGB colour monitor
Disk	microdrive, not yet available
Language	Basic in ROM

The Lynx is enjoyable to use. It can produce impressive visual effects easily and has a good range of useful, if slow, functions. It also has lots of potential: as a good home computer, as a CAL machine or as a small business micro.

If you bought one now, you would find you could have a lot of fun with it, But the Lynx has had production problems. First, the machine itself was late. There is little software as yet. And there are no definite dates for other hardware to come. Its popularity will depend on how fast manufacturer Camputers can produce these, and on the Lynx offerings from the various software houses.

The machine reviewed here is the standard 48k model. 92k, 128k and 192k versions are available and smaller machines can be fully upgraded internally. An upgrade to either 128k or 192k will increase the screen resolution from 248 x 256 to 248 x 512. It will also give an 80-column display.

The actual measurements of the machine are 34.5cm wide, 21.5cm from front to back and 6.5cm at the highest point.

When you first switch on, the Lynx prints its logo, complete with a little pawprint, at the top left of the screen. Under this comes the prompt 'Ready!' and a 'greater than' sign followed by a flashing block cursor.

The Lynx: a proper keyboard

The display is quick to appear and very crisp. Initial tuning is very simple and, once set, it rarely drifts off frequency. The only problem is that the display is rather too sensitive to the position of the TV leads. Jerking this or loosening it slightly – as can happen when the TV gets knocked – can cause the screen to waver. The colours are very vivid and crisp and they don't drift when the machine is tuned. Full upper and lower case lettering is provided directly from the keyboard.

Performance varies from TV to TV. I found the Lynx would not produce colour at all on a nine-year-old Ferguson (neither would the Spectrum), but it worked well with a Sony Trinitron and even better with a small Hitachi portable. If in any doubt, do consult your dealer.

The Lynx provides eight colours, including black and white. These are coded from 0, which is black, to 7, which is white. You can use the colour's name as well as its number. I found that ths improved program readability.

PROTECT is a command which gives some interesting visual effects. The Lynx sends colour signals as a mixture of three colours: red, blue and green. If you type PROTECT RED, everything in red already on the screen cannot be cleared or overprinted. But any new characters or lines with an element of red in their colours will have the red removed.

You can also protect subcolours like magenta or cyan, which means you can print on the screen in only one colour. PROTECT 0 (black) returns you to a three-colour mix again. Protecting white will stop anything from being written on, or erased from, the screen.

It can be unnerving if you forget that anything already on the screen in the protected colour cannot be moved. It looks as if the computer has crashed (hard crash, I mean) if you have listed a program and then run it with a PROTECT statement before a CLS statement.

Colour mixing is possible using a find chequered graphics character (CHR$(242)) as it is on the Spectrum. You can do this only in squares, but the crispness of colour makes it very striking.

You can also define your own char-

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acters. The Lynx character matrix is 6 x 10, which is unusual. It leads to rather elongated lettering but is not unattractive.

The Lynx's screen resolution – 256 x 248 – allows some impressive drawing effects. DOT, DRAW, MOVE and PLOT are the relevant commands. DOT puts a dot on the screen at the specified coordinates. DRAW puts a line on the screen from the last point plotted, or the last position of the graphic cursor, to the point specified. MOVE simply moves the invisible graphic cursor to where you tell it to go. PLOT is rather unnecessary: it has five modes combining all the other graphic commands along with a relative move and draw. In other words, the coordinates represent the amount by which the cursor moves, not the position at which it ends up.

Line drawing is crisp, clear and fast. Lines can be put on the screen at quite steep diagonals without an ugly 'stepping' effect. My big reservation about Lynx graphics is that there is no easy way to fill a shape. The only way I could find to do this was by plotting individual dots, which is slow and inaccurate. It may not have been possible, but a PAINT or FILL command would have made a good replacement for PLOT.

Pixels are individually colour definable. When the DOT command is used, they prove to be very fine and clear in any colour.

OPEN WINDOW

One interesting idea is the use of PRINT@ and WINDOW. Both use columns two pixels wide. PRINT@ uses rows to the highest resolution of 248 to put letters exactly where you want them on the screen. So you can mix text and graphics tidily. WINDOW specifies the size of the text area. You specify the first and the last column +1, and the first and last row +1, to change the part of the screen on which you want to print.

Some fascinating things can be achieved here by using WINDOW in conjunction with PROTECT. Again, I have one reservation: a quick normalising command would have been handy to reset the window to its default. As it is, you have to remember the coordinates of the normal text window and use those numbers to put things back to normal.

The VDU is another Lynx oddity. This uses CHR$ (ASCII) codes 0 to 31 to perform cursor movements and other graphics commands. It is also used for the power-up beeping noise. You can use PRINT CHR$ to do the same thing, so the VDU is rather unnecessary. It is, however, quicker to enter than PRINT CHR$.

Three of the facilities here are really striking. The first is VDU 12 – overwrite. This is like the Spectrum's OVER command and is turned off by inputting VDU 20. Secondly, there's VDU 24 – double-height characters (turned off by VDU 25). You can obtain striking effects by mixing single- and double-height text. Lastly, and more subtly, you can employ superscript and subscript on text. This simply means moving the cursor up or down to give an overlapping effect.

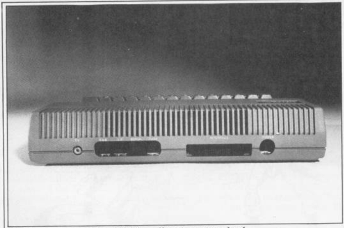
The other VDU codes are for such things as carriage return, colour change, line feeds and backspace. I'll make a huge criticism here: the screen does not scroll.

Sound is based on a digital/analogue conversion principle and is used with two commands: BEEP and SOUND.

BEEP is followed by three figures broken up by commas. They stand for wavelength, number of cycles and volume. Volume is specifiable from 0 to 63, and wavelength and number of cycles from 0 to 65535. The wide parameters make for an impressive range of sounds.

SOUND is a machine code-based command. You can POKE several consecutive addresses with appropriate values, type in SOUND and the first of these addresses. The computer will read them and convert the values to sounds, stopping when it reaches a value of 0. This could conceivably be used to synthesise speech.

You can incorporate machine code into Basic programs by prefixing each line with CODE. INP and OUT read



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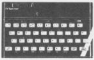
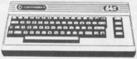
TECHNICALITIES

CPU:	4 mHz Z80A
RAM:	48k (16k graphics, 16k user) expandable to 192k total
ROM:	16k
I/O ports:	expansion bus, cassette, RS232, RGB, composite video
Disks:	single or twin, SS/DD, 250k/drive
Languages:	Basic; Pascal and Forth to come

GAMER





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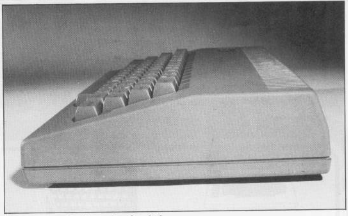

The Lynx's casing is neat and stylish

or send data from/to specified Z80 parts.

A machine code monitor can be accessed from Basic by typing MON; it is exited by typing 'J'. This includes a breakpoint facility as a debugging aid.

On the subject of Lynx Basic, I've got no choice but to express stern reservations. Some of the effects which can be obtained with ease are really striking, but the overall structure is not in keeping with the reasoning behind it. At first sight it looks fantastic from a programming view, but using it for a while reveals serious disadvantages.

David Jansons, who designed Lynx Basic, has had a lot of experience of Microsoft and TRS-80 Basic. 'I don't like them,' he said. His aim in putting together a highly non-standard Basic was to make it 'as structured as possible'. Considering he put the original interpreter together in little over four months, it's quite an achievement. But it has been regularly amended since the machine was announced in September.

It includes some very odd qualities indeed, the reasoning behind which seems a little strange. First and foremost, it won't allow multi-statement lines. The next oddity lies in the number of loops and conditionals provided. Unusual facilities include, most notably, the ability to change the cursor character and the rate at which it flashes.

Debugging is made easier not only by a flow trace but also by a command SPEED. The latter sets the rate of program execution, so you can slow down the program lines to see exactly what's going on. Editing is fairly simple.

Lynx Basic has several omissions which appear to have been replaced by unnecessary trimmings. It repeats itself and thus leaves out more important things. The lack of a reset key makes it possible to get into a terminal crash very easily – for instance, if you get stuck in an input loop you cannot use ESCape to get out of it and you have to switch the machine off. A little thought here would have made all the difference.

Camputers has made dealer agreements with Spectrum Computer Centres and with Lasky's. No plans for more dealers are in the air as Camputers does not want stock-flow problems. It plans to have produced 40,000 Lynxes by the end of this year.

A 12-month warranty is tacked onto the package, but this excludes labour. Servicing after that will be carried out by subcontractors and by 'one of the retailers'.

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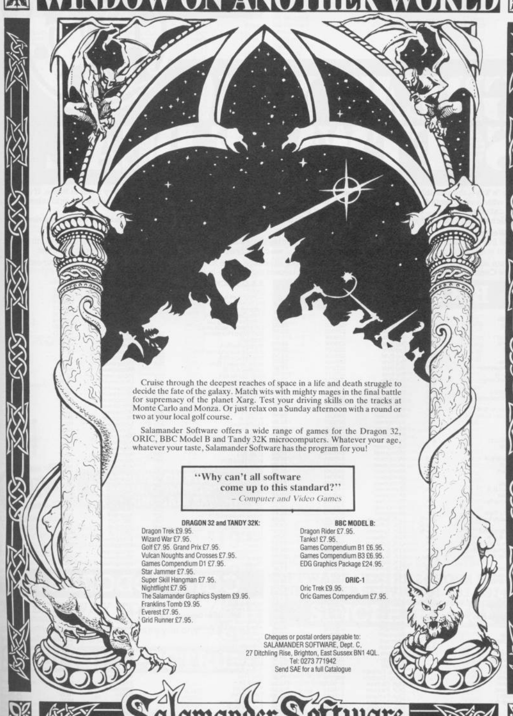

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DRAGON 32

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A guide to some books to help you through the micro maze

TURN OVER A NEW LEAF

WHAT TO READ IN MICROCOMPUTING, A SELECTIVE BIBLIOGRAPHY WITH ANNOTATION

BY C SAIADY AND A V STOKES, PUBLISHED BY GOWER PUBLISHING COMPANY AS A 103-PAGE PAPERBACK AT £9.50

This is an admirable attempt to help more micro users decide what books suit them best.

The bibliography lists more than 400 books, dividing them into four main categories: background, languages, specific micros, and hardware and software. It also lists them by publisher, by author, and by title and comments on who would find them useful.

It provides a good guideline as to what is now available – there are, for instance, 26 titles beginning 'Basic ...'

At £9.50 it is quite costly. But it does put the micro book market into perspective, and may save its price. **Cyndy Miles**

LEGAL CARE FOR YOUR SOFTWARE

BY DANIEL REMER, PUBLISHED BY ADDISON WESLEY AS A 247-PAGE PAPERBACK AT £11.95

Now that you have turned your brainwave into a software product that is bound to be the ultimate money-spinner, how do you know that you are not going to be ripped off?

To be honest, you don't. At any time prior to, during and after your product hits the streets, every shark around will be nosing about after a fast buck.

Legal Care for Your Software tries to cover this problem in detail by looking at patent law, copyright, trade secrets, trademarks, copy protection, contracts, and limited liability.

Unfortunately, it only deals with the legal aspects and implications of the US legal system. Someone has yet to produce an equivalent version for Britain.

The basic problem both here and in the US is that software usually has a short life. So safeguarding your software with legal methods involves careful examination to discover which methods should be used. Copyright is one, but has drawbacks in that it only covers 'an original expression of an idea' and not the idea itself.

This means that any public domain or copied sections are not copyright, even if the rest is.

If a copyright does not cover all your needs, you can take out a patent – but registration can take up to two years.

Bearing in mind the price of *Legal Care for Your Software*, I would recommend it only to the most serious of people. Even then, it should be used in conjunction with a lawyer. **Nic Jones**

CHOOSING A MICROCOMPUTER
FRANCIS SAMISH

CHOOSING A MICROCOMPUTER

BY FRANCIS SAMISH, PUBLISHED BY GRANADA AS A 140-PAGE PAPERBACK AT £4.95

Shopping for a micro can be a big headache. That's where this book, and others like it, can help.

'Try before you buy,' warns the author. 'Don't buy any micro through mail order unless you have been able to inspect the machine beforehand,' he adds.

There are 13 chapters in all. They skim over a wide span of subjects – hardware, software, technology, programming, and other relevant matters – to give a general feel of the micro market. A glossary of computer jargon rounds everything off.

Although supposed to be aimed at both home and business users, the book tends to favour business. In the last chapter, for instance, the home user loses out when a list of business packages is given.

Another problem which besets all books of this nature is that they can get out-of-date quickly.

But if you need some rough guidelines before reaching for your chequebook, *Choosing a Microcomputer* isn't bad value. **Wendie Pearson**

COMPUTER LANGUAGES AND THEIR USES

BY GARRY MARSHALL, PUBLISHED BY GRANADA AS A 108-PAGE PAPERBACK AT £5.95

No one can say that this book alienates the newcomers. With the opening line 'A computer language is a language for communication with a computer', it takes a stand among the not-too-advanced users.

Garry Marshall takes you through Basic and out the other side to Prolog, Gino-F, Comal and Lisp.

There's a discussion of language development before a comparison of Basic with the other languages. There is also an explanation of how those languages can be used with databases, 3-D graphics, and simulation.

The instructions are made clear with program listings and diagrams, and techniques are explained and reviewed.

The book is written in so light and easy a way that even new users will get a broad understanding of what they can do with their micros. **CM**

Neil Cryer and Pat Cryer
BASIC Programming on the BBC Microcomputer
Approved by ACORN COMPUTERS

BASIC PROGRAMMING ON THE BBC MICROCOMPUTER

BY NEIL AND PAT CRYER, PUBLISHED BY PRENTICE HALL INTERNATIONAL AS A 195-PAGE PAPERBACK AT £5.95

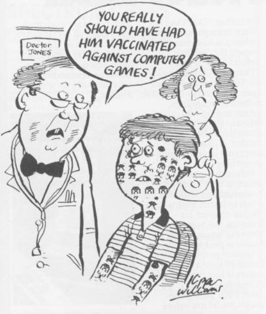
Three cheers. The authors have spotted that using variables such as X, Y, and Z complicates the issue. You could easily replace 'oil filter' for X, 'oil' for Y, and 'labour' for Z.

This book puts Basic in plain English, rather than making it look like a mathematical mess. It takes you from scratch and must surely be the toddlers' guide to learning Basic.

Chapter 9, Animation for Games, had me glued to the spot, learning how to create animated snakes and bouncing balls. And it continues to be very readable when it explains mathematical functions and string handling, file handling, programmable characters and sound.

The cherry on the top is the mine of information in the glossary and index. This book is well worth the investment. **WP**

KIPPER WILLIAMS PLAYS AROUND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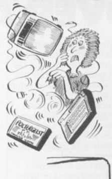
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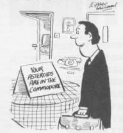
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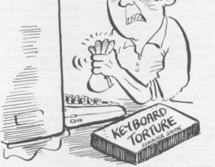
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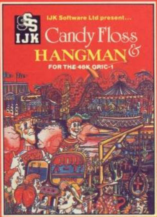
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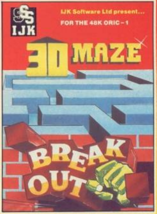
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CHALLENGE

'Captain Kirk to Enterprise – we're trapped inside a vintage 1983 Welsh computer. Scotty, can you beam us up? Come in.'

'I'm sorry Captain. But thuh ship's in thuh grip of a tarrible force culled Basic, which is holding us and you inside the computer and leaving control uf all ar lyves to thuh whim of sum 20th Century computer boffin. All ye can du is sit tight and hope thuh computer boffin knows what he's a-doin.'

'Thanks loads, Scotty. Remind me about this next time you need a wage rise. Kirk out.'

Yes, indeed. Captain Kirk and his crew have been trapped on magnetic tape and stuffed into 20th century computers by large numbers of people. The latest of these is Salamander Software's stuffing of the good ship and her crew into the Dragon 32.

The game allows you, your Dragon and its joystick to steer the ship through a variety of obstacles and strange alien encounters. You must help the starship Enterprise complete its five-year mission.

HOW TO WIN

Well, knowing how to 'win' at Star Trek has as much to do with knowing how to play video games as it does to do with knowing about the TV series that has spawned so many computer versions of the game.

In this game, the only new civilisation you are likely to find is the good old Klingons'. As the game opens, you are told that 'a force of Klingons has invaded federation space. Your mission is to rid the galaxy of this menace. Three starbases are standing by.'

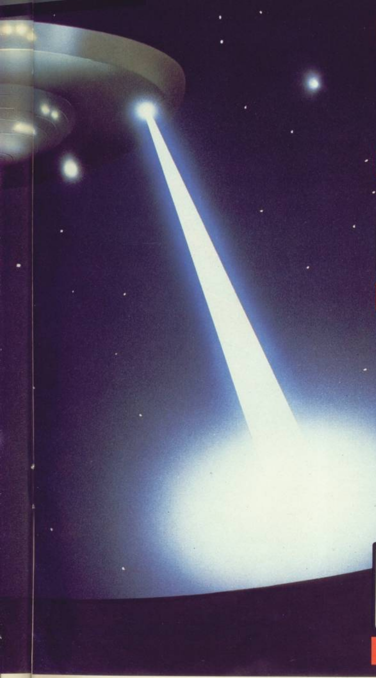
The best advice is to read the manual thoroughly. You may think you know the Enterprise well. But she is a complicated ship and will need all your expert knowledge and advice to survive the hard times ahead of her.

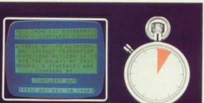
VIDEO VERDICT

This is a must for Star Trek fans who have entered the Dragon. It neatly combines the adventure game-style text formats with some arcade action involving the Dragon joystick. A good game for both beginners, because it's challenging, and for experts – because it is so complicated you will spend a long time trying to figure out all its angles.

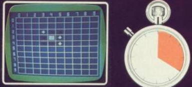
Price: £9.95 from Salamander Software. **Media:** cassette. **Requirements:** Dragon Data 32 with joystick. **Language:** Basic.

REK

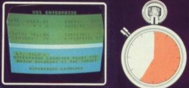




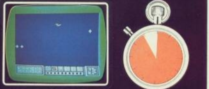
Commander, you must get rid of the Klingons!



A map of your corner of the galaxy.



Turn on the force field – how long will it last?



Hyperprobe launched…

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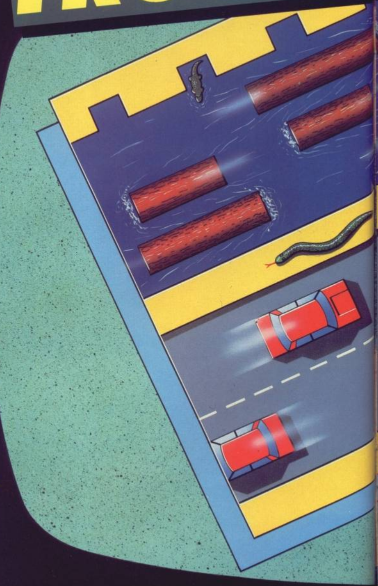


CHALLENGE

You are, believe it or not, a frog.

As a proud member of the amphibian race, you must get yourself across a highway, then a river and safely on to your comfortable lily pad.

The players of other video games might be 'green' with envy at this seemingly simple task, but there are real hazards to prevent you from hopping your way home. The highway is full of frog-squashing traffic. The edge of the road is riddled with starving snakes. And the waters are crawling with crocodiles.

There is a bonus in your river-crossing challenge. A lady frog is languishing on one of the logs – and you get extra points from rescuing the damsel in distress and taking her home to your lily pad.

HOW TO WIN

The trick in this BBC version of the popular video game is to get an idea of the response time of your keys. Once you know how quickly the frog is going to move after you press the key (hint: it's slower than you think), you will be in a good position to get through the traffic section.

Once you get to the other side of the road, you will be relatively safe for a few moments – providing you keep a sharp eye out for the snake that patrols that side of the road.

Next comes the challenge of the logs. You will notice there are three rows of logs moving parallel to one another. The first row moves from right to left, the second from left to right and the third from right to left again.

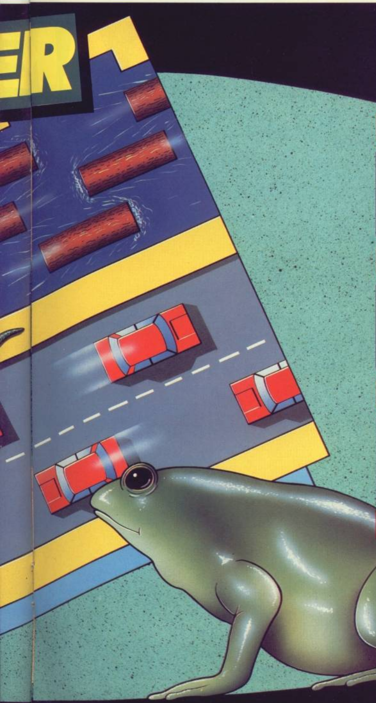
If you miss the lady frog the first time it comes round, you can hop back and forth between the logs until you do. Don't let yourself hit the right or left of the screen, where you'll meet an untimely end.

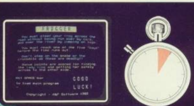
When you are near the other side, you must look closely to make sure there are no crocodiles lurking near your lily pad. If you are successful, there will be a little fanfare.

VIDEO VERDICT

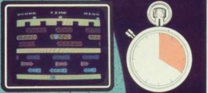
This is a good implementation of the classic amphibian video game. The controls could perhaps be more responsive than they were. But a little time spent getting the feel of the keys should solve the problem.

Price: £8.00. **Media:** cassette. **Distributors:** A & F Software, 839 Hyde Road, Gorton, Manchester, M18 7JD, and most BBC micro dealers that stock A & F programs. **Requirements:** standard BBC micro and cassette recorder. **Language:** machine code.

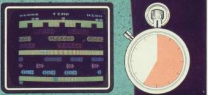



FROGGER
GOOD
LUCK!

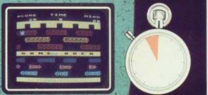
Just follow the instructions. Simple, isn't it?


SCORE
TIME
HIGH

There she is, your lady frog. Run, run, run.


SCORE
TIME
HIGH

Don't let that snake surprise you. It's dangerous.


SCORE
TIME
HIGH
GAME OVER

G-asp! Better luck next time – perhaps.

UP, UP AN

CHALLENGE

Flying the balloon in Pulsar Software's Up, Up and Away for the Atari computer would be easy – if there weren't kids with slingshots, lightning bolts from foreboding black clouds, windmills, kites and small planes all trying to pull you out of the sky.

So the main challenge is simply a matter of staying alive. If your balloon is hit by something, or runs out of fuel, it will deflate and plummet like a stone.

HOW TO WIN

Keep your eyes open and your hands tightly on the joystick. You will have to be careful from the moment you take off.

The first danger you are likely to face is the kid with the slingshot. For some reason, that kid feels the need to sling arrows at your innocent little balloon (the rotter). You can move quickly, by thrusting the joystick hard to the right, and try to avoid the shot. Alternatively, you can manoeuvre round it once the shot has been taken.

If you manage to make it past the kid, you will have either a storm or a crazy aerobatic pilot to face. The pilot seems to move completely at random. He is happy to hit your balloon with his propellor and cause your eventual downfall. As for the storm, unless you are careful a bolt of lightning will strike you with a crack of thunder.

Avoiding the previous slings and arrows was relatively simple. You will have to keep practising your manoeuvres to avoid the plane. The storm clouds are best survived by moving quickly into the spot between two clouds.

At the lower skill levels, the windmill should not pose too much of a hazard. Later, it can take considerable dexterity to survive. The trick here is to be travelling high enough and fast enough so that you don't get sucked down to the ground by the force of the suction generated by the windmill.

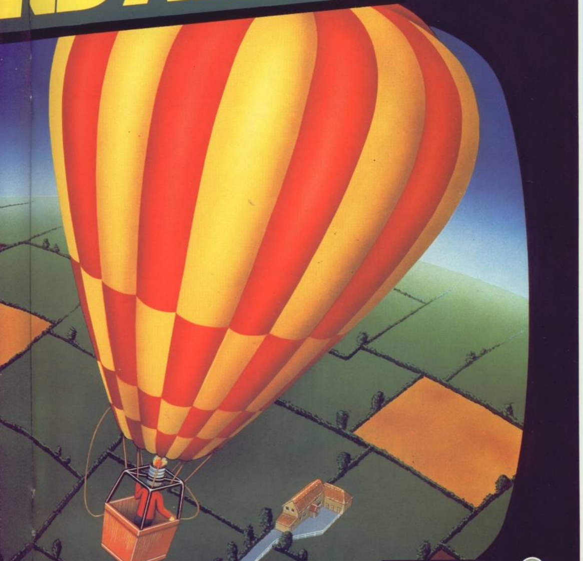
The kite is perhaps the trickiest challenge for beginners, but actually one of the easiest to figure out. You must restrain yourself from flying past the kite until its owner moves the kite to the right.

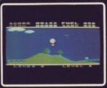
VIDEO VERDICT

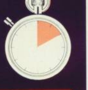
A nice simple game without too much violence. Something to quietly get frustrated with when you have had it up to your eyeballs with the Star Raiders, Space Invaders and Pacmen.

Price: £21.95 from Pulsar Software.
Requirements: standard Atari 800/400. **Media:** cassette or disk.
Language: machine code.

ND AWAY




SCORE
FUEL
LEVEL



Flying high — but beware that kid and the deadly kite.

KAKTUS

CHALLENGE

This is Space Invaders with a difference. You are a gopher and hordes of insects are invading your space. They are threatening to destroy your very own Kaktus (sic) what you planted with your own two paws.

These aren't just any old desert insects. The bugs in Kaktus (note the mild pun here and feel free to laugh any time) release acid drops. These will kill you if you get hit by them, and will destroy the cactus if you are not careful.

Since your very *raison d'etre* is to protect the poor embattled cactus, it is not surprising that you should put your life on the line to save it. To ward off the pesky insect invaders, you must shoot through the hole at the top of your burrow and kill them. Your exact weapon is not clear – and gophers are not generally noted for their marksmanship.

If the bugs do manage to break through the ground above your head you can shoot them through that break in the ground.

HOW TO WIN

If you know how to win at Space Invaders, figuring out Kaktus should be no great problem. Like the shields in Space Invaders, the ground above your head can serve as an alternative place to fire through. It can also serve as a protection from the bugs blasting down on you.

You can move out of the hole and face the bugs from above ground. But unless you are highly dexterous in keeping away from the bugs, this is sheer video suicide.

If you stay above ground for too long, you run the chance of having a mole cover your hole over with dirt, trapping you in the land of the small stinging beasts. So the best strategy remains shooting from below the hole. Take advantage of any holes that are blown in the ground by using them as portals through which to blast the acid-dropping critters.

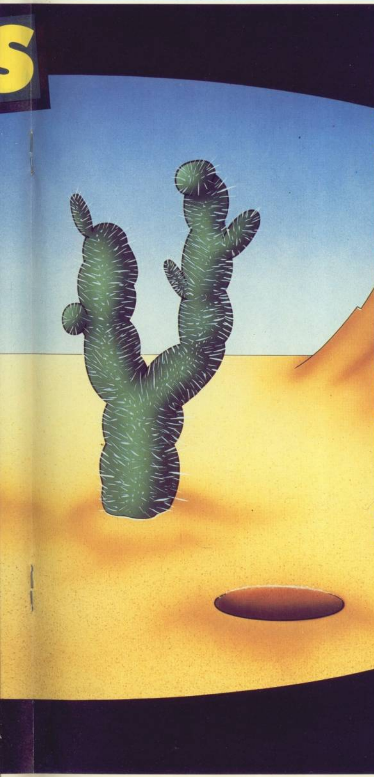
You get three lives. So you can afford to take a few chances on the first one, and perhaps pop up to the ground to rack up a few points. Then become more conservative in your play with the other two lives.

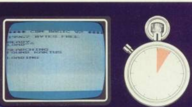
ACTION FREEZE
56

VIDEO VERDICT

A nice variation on the theme. The concept of acid-dropping insects, armed gophers and marauding moles must be ranked among the more inventive introduced for games on the Vic 20. You will need an expanded Vic to run the game – at least 8K. It will support a joystick.

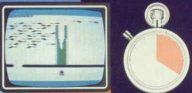
Price: £7.95. **Media:** cassette.
Distributors: Audiogenic.
Requirements: expanded Vic (8K).
Language: machine code.



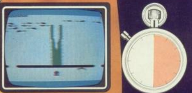


```
**** CBM BASIC V2 ****
[illegible] BYTES FREE
READY.
LOAD
SEARCHING
FOUND KAKTUS
LOADING
```

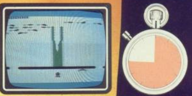
Patience is a virtue when loading cassette-based programs



...but the screen jumps to life as you battle the bugs.



Watch that mole! You won't get a second chance.



Too late. The kaktus will soon lose its sole defender.

FLIGHT

CHALLENGE

Flying is never an easy business. And the good folks at Oric have not deigned to make it easier with their new Oric Flight program.

You are the pilot. You control the plane. And you are responsible when it crashes – oops, I mean when it lands safely.

The Oric flight manual is a rather thin document – three pages in all. But it gives you all you need to know about the art of flying.

Think you can do it? Wait. 'Below the main screen the various instruments are provided in an easy-to-read digital form,' the manual explains. 'The artificial horizon is shown as an artificial horizon display if you are currently banking the aircraft in order to turn around. As it represents the actual visible horizon, it slants in the opposite direction to your banking.'

Well, now that we've all read out flight manuals and looked up all the tough words in our pilot's glossaries it's time to hit the skies.

HOW TO WIN

Your best friend in this game is your instrumentation, and Oric Flight's instruments are relatively non-standard issue. That doesn't mean you have a non-standard friend. Ordinary aircraft gauges and dials can be quite confusing and Tansoft's decision to represent them as digital readouts makes flying that much easier.

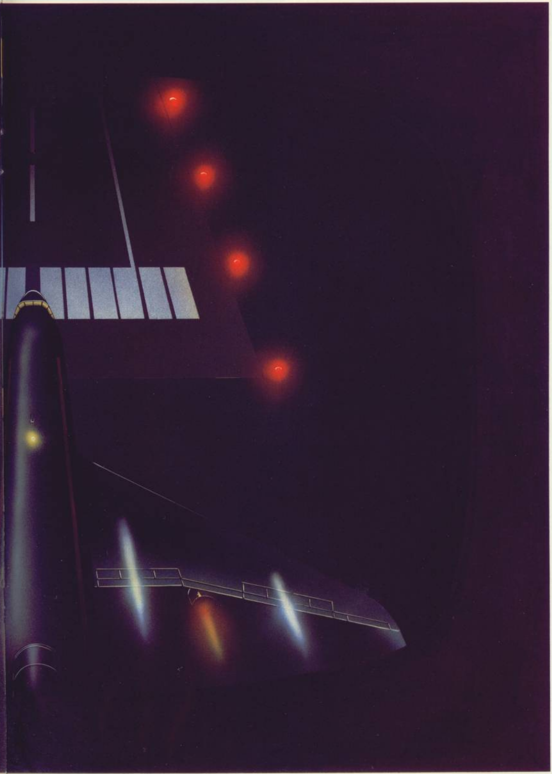
Start by getting your bearings. They are given as a number in the bearing readout at the bottom left-hand corner of the screen. North is 0 degrees, East 90 degrees, South 180 degrees, West 270 degrees. You must land exactly in an East-West direction.

The usual flying rules apply, as well. Keep your nose and throttle high during take-off, but bring back both once you have finished your climb. The ascent and descent rates are given in feet per second. When ascending, keep an eye on your fuel as you can fly only a certain time before you need to refuel. And running out of petrol at 30,000 feet is never fun.

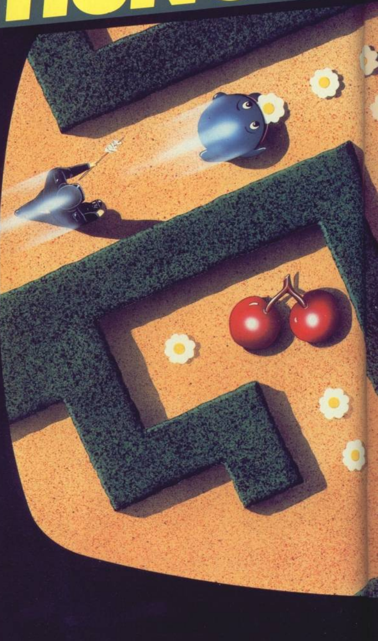
VIDEO VERDICT

A good flight simulator for the Walter Mitty jet pilot set. Perhaps not as realistic as some, but the 3D action replay of your crash at the end of the game is enough to unnerve and challenge even the bravest of pilots. Entrance fees to the PCG Oric flying school are surprisingly reasonable ...

Price: £21.95 from Tansoft Software. **Requirement:** 48K Oric-1. **Media:** cassette. **Language:** Basic/machine code.



HUNGRY



CHALLENGE

In Hungry Horace, the first of our blue friend's adventures, Horace wants nothing more than a little food to see him through his stroll in what seems to be a rather large park.

Unfortunately, there are few concession stands and food outlets in the park – most people seem content to bring their own lunches. Horace has absent-mindedly forgotten to make one of his own. So he decides to steal other people's lunches. It's your job to help him.

Horace's efforts to cadge cuisine are opposed by the park's guards who pursue him from the moment the game starts. His only defence is to ring the park alarm bells that send the guards scurrying in every direction looking for the cause of the trouble.

In Horace Goes Skiing, our intrepid hero wants merely to make his way across the road to rent skis and then move on to the slopes. He wants to show off his schussing to all the young Horacettes sunning themselves in the cool video slopes of Mount Spectrum.

In Horace and the Spiders, Horace laughs in the face of adversity as he survives – we hope – the dangers of bridge and mountain to battle a pack of deadly spiders.

For Horace novices, we will personally tackle our friend's first adventure: his food-snatching farce in Hungry Horace.

HOW TO WIN

Very carefully ... There are a few dead ends in Hungry Horace mazes. You will find Horace trapped and ready for easy capture by the park's guards if you lead him into one of those dead ends.

You must make sure Horace is never farther away from an alarm bell or exit than the guard chasing him. Make sure also that you don't get mixed up as to which button is moving Horace to which place. In moments of panic you may be likely to send poor old Horace into the waiting arms of a park guard.

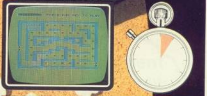
The best advice is simple observation. You will soon find that some patterns work better than others in moving you through various mazes.

VIDEO VERDICT

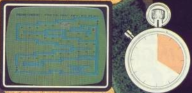
A Spectrum classic. It's a pretty safe bet that the spiders will regret the day they met Horace and we will soon see the lovable blue blob's next episode.

Price: £5.95. **Media:** cassette. **Distributors:** WH Smith and Sinclair dealers. **Requirements:** 16K Spectrum. **Language:** assembler.

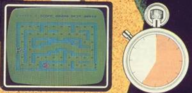
Y HORACE



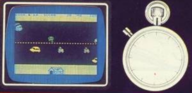
Relax before some serious playing – this is the easiest level



Narrow corridors and flying lunches make for a hard time



Will Horace tiptoe quietly enough to sneak past the guards?



Horace is unaware of trouble ahead in 'Horace Goes Skiing'

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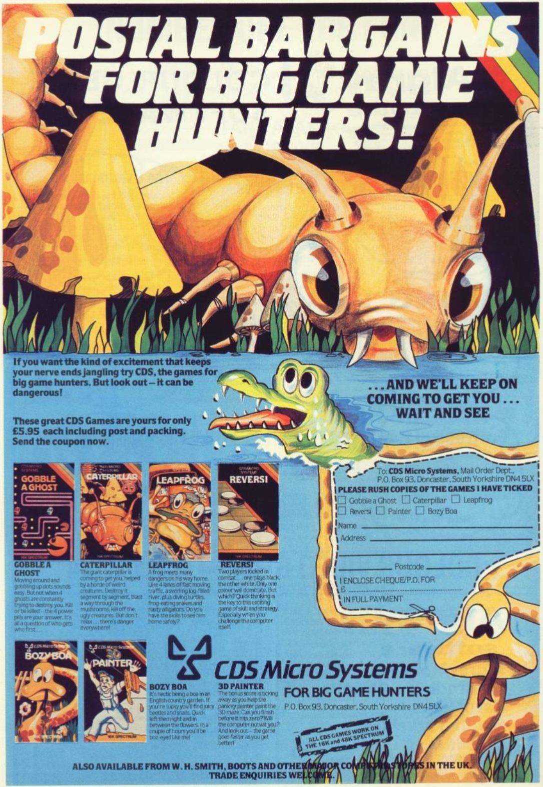
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The giant caterpillar is coming to get you, helped by a horde of weird creatures. Destroy it segment by segment, blast a way through the mushrooms, kill off the ugly creatures. But don't relax ... there's danger everywhere!

LEAPFROG
A frog meets many dangers on his way home. Like 4 lanes of fast moving traffic, a swirling log-filled river, plus diving turtles, frog-eating snakes and nasty alligators. Do you have the skills to see him home safely?

REVERSI
Two players locked in combat ... one plays black, the other white. Only one colour will dominate. But which? Quick thinking is the key to this exciting game of skill and strategy. Especially when you challenge the computer itself.

BOZY BOA
It's hectic being a boa in an English country garden. If you're lucky you'll find juicy beetles and snails. Quick left then right and in between the flowers. In a couple of hours you'll be boz-eyed like me!

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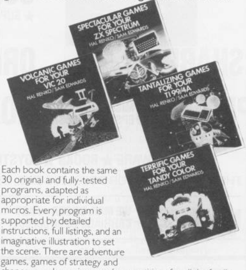
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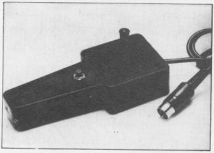

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GAME Backgammon
MACHINE Atom

```
   0 REM *********************
   1 REM ****BACKGAMMON*******
   2 REM ***BY P.ROBINSON*****
   3 REM ******MCMLXXXI*******
   4 REM *********************
   5 REM
   9 P=£81;P.$21;[JSR£FFE3;STA£80;RTS;];P.$6
  10 CLEAR4;Q=£8000
  20 F.A=1TO182S.2;MOVE10,A;DRAW222,A;N.
  25 F.A=11TO221S.2;MOVEA,10;PLOT5,A,182;N.
  30 F.A=1TO12;Z=0;F.B=-16TO0;IFA>6Z=16
  40 MOVE(A*16+3+Z),112;PLOT(7-(1-(A%2))*2),(A*16+11+B+Z),182
  50 MOVE(A*16+3+Z),60;PLOT(7-(A%2)*2),(A*16+11+B+Z),10;N.;N.
  60 MOVE9,10;DRAW9,182;DRAW220,182;DRAW220,10;DRAW9,10
  70 MOVE8,9;DRAW8,183;DRAW221,183;DRAW221,9;DRAW8,9
  80 MOVE7,8;DRAW7,184;DRAW222,184;DRAW222,8;DRAW7,8
  90 F.A=1TO11;MOVE(109+A),10;DRAW(109+A),182;N.
 100 DIMPP26;F.A=0TO26;PPA=0;N.;PP1=20;PP6=5;PP8=3;PP12=50;PP13=5
 110 PP17=30;PP19=50;PP24=2
 115 DIMWW4,BB4;V=£2800
 120 !V=£FFFF7E3C;V!4=£3C7EFFFF;V!8=£8181423C;V!12=£3C428181
 122 V!16=£10284444;V!20=£00101010;V!24=£44444438;V!28=£00384444
 124 V!32=£44444444;V!36=V!28;V!40=£78444478;V!44=£00444444
 126 V!48=£44546C44;V!52=V!44;V!56=V!24;V!60=V!28;V!64=V!32
 127 V!68=£00102828;V!72=£7840407C;V!76=£007C4040
 150 F.B=1TO24;IFPPB<>0 GOS.c;GOS.d
 170 N.
 200 GOS.w;X=£881C;F.A=0TO3;F.B=0TO7;?(X+A+B*32)=0
 220 X?(A+B*32)=(X?(A+B*32)):(V?(B+16+A*8));N.;N.;X=£8C5C
 230 F.A=0TO3;F.B=0TO7;?(X+A+B*32)=0
 240 X?(A+B*32)=(X?(A+B*32)):(V?(B+48+A*8));N.;N.
 245 B=1
 250 IFB=25 B=1
 254 X=(12-B)*16+18;Y=10;IFB<7X=X+16
 255 IFB>12 X=(B-13)*16+18;Y=184;IFB>18X=X+16
 260 L=Q+(192+Y)*32+X/8;?L=0;F=L
 270 LINK£81;E=?£80
 276 IFPP25<>0B=25;G.290
 280 IFE=91B=B+1;B=B%25;?L=255;IFB=0B=1
 285 IFE=93B=B-1;B=B%25;?L=255;IFB=0B=24
 290 D=0;N=0;F.A=7TO24;IFPPA<9 N=N+PPA
 296 N.;IF N=0 D=1
 300 E=E-48;IFE<>WW1 IFE<>WW2 IFE<>WW3 IFE<>WW4 IFE<>0 G.250
 310 IFE=0;?F=255;G.400
 320 IFPPB>9ORPPB=0 P.$7;G.250
 325 IF(B-E)>0 ORD=0;G.330
 326 GOS.c;GOS.m;PPB=PPB-1
 327 N=0;F.A=1TO6;IFPPA<9 N=N+PPA
 328 N.;IFN=0 A=0;G.6000
 329 G.365
 330 IF(B-E)<1 P.$7;G.250
 335 IFPP(B-E)=5 P.$7;G.250
 340 IFPP(B-E)>19 P.$7;G.250
 342 IFPP(B-E)<>10;G.360
 343 B=B-E
 344 GOS.c;GOS.m;PPB=0;PP0=PP0+10;X=115;Y=108+(PP0/10)*9;B=B+E
 346 C=Q;S=0;GOS.m
 360 IFB<>25 GOS.c;GOS.m
 361 IFB=25 X=115;Y=92-PP25*9;C=Q
 362 PPB=PPB-1;B=B-E;PPB=PPB+1;GOS.c;GOS.m;B=B+E
 365 IFE=WW1 WW1=0;G.390
 370 IFE=WW2 WW2=0;G.390
 375 IFE=WW3 WW3=0;G.390
 380 IFE=WW4 WW4=0;
 390 IFWW1<>0 OR WW2<>0 OR WW3<>0 OR WW4<>0 G.250
 399 IFB<>25;?F=255
 400 X=£881C;F.A=0TO3;F.B=0TO7;?(X+A+B*32)=0
 410 ?(£881D+B*32)=V?(B+48);?(£881E+B*32)=V?(B+16);N.;N.;GOS.b
 420 IFPP0=0 G.495
 425 M=0;F=0;D=0
 430 F.A=1TO4;S=1;E=BBA;IFE=0G.475
 440 P=PPE;IFP=10 S=S+3
 445 IF P=50 S=0;G.475
 450 IF P<10 AND P>1 G.475
 460 IFP=1 S=S+2
 470 B=0;IF S>M F=A;M=S
 475 N.;E=BBF;BBF=0;IFF=0;G.200
 476 G.542
 495 D=0;N=0;F.A=1TO18;N=N+PPA/10
 496 N.;IF N=0 D=1
 500 M=0;I=0;DO I=I+1;P=PPI;IFP<10 G.524
 501 F.A=1TO4;S=0;E=BBA;IFE=0G.520
 503 IFI+E=25AND D=1 S=200;G.516
 504 IFI+E>24 AND D=0 G.520
 505 IFI+E>24 AND D=1 S=20;IF I>25-E;S=1;G.516
 506 P=PP(I+E);Q=PPI;IFD=1G.516
 508 IF P=50 S=0;G.520
 509 IFP<10 AND P>1 G.520
 511 S=(24-I)/6;IFQ=20 AND I>17 S=1
 512 IFP=1 S=S+2
 513 IFP=10 S=S+2+I/4
 514 IF Q=10 AND P=10;S=S+3+I/3
 515 IF Q>20 AND P=10;S=S+5+I/3
 516 IF S=M S=S+R.%2;G.516
 518 IF S>M G=I;F=A;M=S
 520 N.
 524 UNTIL I=24;E=BBF;BBF=0;IF M=0 G.200
 525 IF(B+E)<25 OR D=0;G.542
 526 GOS.c;GOS.m;PPB=PPB-10
 527 N=0;F.A=19TO24;N=N+(PPA)/10;N.
 528 IFN=0 A=1;G.6000
 530 G.595
 542 IFPP(B+E)<>1;G.560
 543 B=B+E
 544 GOS.c;GOS.m;PPB=0;PP25=PP25+1;X=115;Y=92-PP25*9;B=B-E
 546 C=-Q;S=0;GOS.m
```

ATOM BACKGAMMON

BY PETER ROBINSON

Backgammon players should appreciate this game. It's nicely crash-proofed and makes good use of the Atom's high resolution graphics.

It is assumed that the user knows how to play backgammon. So if you don't know how to play you will need a set of rules.

It requires the full memory expansion on the Atom – 12K RAM. All play is against the computer, which moves the black pieces. You are allowed to go first; but if you'd rather give your micro a chance, press the zero key when the prompt of 'your turn' appears on the screen. Pressing this key at any other time when it is your turn lets the computer know you can't move.

To move, you use numbers in accordance with a pair of white dice displayed on the screen. Illegal moves are indicated by a tone from the speaker. You have to position the cursor (which appears under the bottom right triangle) under the piece you want to move using the '[' and ']' keys. You then press the number key corresponding to the dice value you wish to move. This moves the piece the required number of points.

If one of your pieces is 'hit', it will appear on the bar. You will be unable to move the cursor until all your pieces have been moved from there. You can remove your pieces simply by pressing the key with the required number on it. Bearing-off is performed in the same manner as for any other move except that the piece is actually moved off the board.

Our thanks to the Anglia Computer Centre for this listing.

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Type ....
PCG

GAME Backgammon
MACHINE ATOM

```
 560 IFB<>0 GOS.c;GOS.m
 561 IFB=0 X=115;Y=108+(PP0/10)*9;C=Q;S=0;P=PP0/10;GOS.m
 562 PPB=PPB-10;B=B+E;PPB=PPB+10;GOS.c;GOS.m;B=B-E
 595 IFBB1+BB2+BB3+BB4<>0 G.420
 600 G.200

4995 E.
5000 cP=PP9;Q=0
5010 IFP<10 Q=1
5015 IFP>9P=P/10
5020 X=(12-B)*16+13;Y=20;S=-£120;IFB<7X=X+16
5030 IFB>12 X=(B-13)*16+18;Y=191;S=£120;IFB>18X=X+16
5035 C=B&2;R.
5040 dL=(192-Y)*32+X/8+0;Z=8;IFC=Q Z=0
5050 F.A=1TO P;F.K=0TO7
5060 ;?(L+K*32)=(?(L+K*32)):(V?)K+Z));N.;L=L+S;N.;R.
5100 mIFP=0 R.
5110 L=(192-Y)*32+X/8+0;L=L+(P-1)*S;Z=6;IF C=Q Z=0
5120 F.K=0TO7;?(L+K*32)=(?(L+K*32)):(V?(K+Z));N.;R.
5200 wF.A=34TO54;MOVEA,86;DRAWA,106;MOVE(A+30),86;DRAW(A+30),106
5210 N.;WW1=A.R.%6+1;WW2=A.R.%6+1;WW3=0;WW4=0;IFWW2<>WW1G.5220
5215 WW3=WW1;WW4=WW1
5220 Z=0;GOS.((WW1*20)+5230);Z=30;GOS.((WW2*20)+5230);R.
5225 bF.A=145TO167;MOVEA,86;PLOT7,A,106;MOVE(A+30),86
5230 PLOT7,(A+30),106;N.;BB1=A.R.%6+1;BB2=A.R.%6+1;BB3=0;BB4=0
5231 IFBB1=BB2;BB3=BB2;BB4=BB2
5240 Z=112;GOS.((BB1*20)+5230);Z=142;GOS.((BB2*20)+5230);R.
5250 X=44;Y=96;GOS.s;R.
5270 X=39;Y=101;GOS.s;X=49;Y=91;GOS.s;R.
5290 X=39;Y=101;GOS.s;X=49;Y=91;GOS.s;X=44;Y=96;GOS.s;R.
5310 X=39;Y=101;GOS.s;Y=91;GOS.s;X=49;GOS.s;Y=101;GOS.s;R.
5330 X=39;Y=101;GOS.s;Y=91;GOS.s;X=49;GOS.s;Y=101;GOS.s;X=44
5340 Y=96;GOS.s;R.
5350 F.X=39TO49S.10;F.Y=91TO101S.5;GOS.s;N.;N.;R.
5400 sF.A=-2TO2;K=2-A.A;MOVE(X+K+Z),(Y+A);PLOT6,(X+Z-K),(Y+A)
5410 N.;R.
6000 P.$12;IFA=0G.6100
6010 P."            I WIN!"''"COMPUTERS REIGN SUPREME!!"'''
6020 G.6200
6100 P."CONGRATULATIONS ON A SKILLFUL WIN"''''''
6200 P."DO YOU WANT ANOTHER GAME?";LINK£31;IF?£80=89 RUN
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HISOFT PASCAL DEVPAC

Hisoft Pascal 4 is a very fast and powerful microcomputer Pascal compiler that is the result of three years development work. The compiler conforms very closely to Standard Pascal as described in the Pascal User Manual and Report (Jensen/Wirth) and produces Z80 object code directly in one pass; no P-codes to be subsequently interpreted. HP4 is also small (not more than 19K including runtime routines and tables) but this does not imply any lack of power - the compiler and runtimes were written in Z80 assembler language and a great deal of time was spent on increasing the speed and decreasing the size of the critical routines.

We have designed HP4 to be simple to use, very fast, close to Standard Pascal (with extensions) and inexpensive. Thus we see it as being an attractive package in the educational field (from teaching yourself at home to teaching students at university level) and in the area of systems development. To this end Hisoft Pascal 4 is available in both cassette tape and diskette versions for a wide range of Z80 machines. The tape and disk versions are virtually identical except that the cassette version does not support FILEs, instead the user is given the ability to store and retrieve any variable to and from tape. The tape version (HP4T) is organised in a manner that makes it very easy to adapt to most Z80 systems and we supply details on how to do this in our HP4T Alteration Guide available separately.

In addition to our Pascal we also have available DEVPAC - a Z80 development package which includes a fast and powerful conditional assembler, a labelling disassembler, a debugger with single-step facility and (on diskette) an extended screen editor. DEVPAC is available in a limited number of formats at the moment and we are working to increase these.

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HISOFT PASCAL 4 tape version (SHARP MZ80A/K, NEWBRAIN etc.)	£40.25
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All the above prices are fully inclusive of 15% VAT and P&P within the UK. Add £2 for orders to the mainland of Europe and £4 to other countries.

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GAME Blaster
MACHINE SPECTRUM

```
   5 GO SUB 520
  10 REM ...Alien Blaster...
  20 REM ...C Alan Green ...
  30 REM ...    1982     ... *
  40 FOR n=0 TO 7:READ j:POKE USR "A"+n,j:NEXT n
  50 FOR n=0 TO 7:READ k:POKE USR "B"+n,k:NEXT n
  60 FOR n=0 TO 7:READ l:POKE USR "C"+n,l:NEXT n
  70 LET a=10: LET s=0: LET q=1
  80 LET z=31: LET y=120
  90 PRINT AT 12,4;"Do you want instructions?"
  95 BEEP .1,20: LET a$=INKEY$:IF a$="y" THEN GO TO 380
  96 IF a$="n" THEN GO TO 100
  97 IF a$="" THEN GO TO 95
 100 BORDER 1: PAPER 1: INK 6: CLS
 110 PRINT AT 1,0; BRIGHT 1; INK 3;
"--------------------------------";AT 19,0;INK 6;
"--------------------------------"
 120 PRINT AT 0,2; BRIGHT 1; INK 5;"Score 0";AT 0,16; BRIGHT 1;
INK 5;"High ";ss
 150 LET c=INT (RND*30)+1: LET b=3
 152 IF c<=5 THEN LET w=2000
 153 IF c>5 AND c<26 THEN LET w=3000
 154 IF c>=26 THEN LET w=1000
 155 LET ch=INT (RND*2)+1
 160 PRINT AT 18,a; INK 6;" A ";AT b-1,c-1;"   ";AT b,c;
INK 4;CHR$ (ch+144)
 170 LET x=(a*8)+12
 180 LET a=a+(INKEY$="2" AND a<=28)-(INKEY$="1" AND a>=1)
 190 PLOT x,z: PLOT OVER 1;x,z
 200 IF INKEY$="0" THEN DRAW INK 5;0,y: BEEP .025,20:
PLOT x,z:DRAW OVER 1;0,y:GO TO 260
 205 GO SUB w
 210 LET b=b+1: BEEP .01,19-b: IF b=19 THEN GO TO 230
 212 PRINT AT 18,a; INK 6;" A "
 214 LET a=a+(INKEY$="2" AND a<=28)-(INKEY$="1" AND a>=1)
 220 GO TO 160
 230 BEEP .5,-20
 240 PRINT AT 18,c-1;"   ": PRINT AT 21,q*2; INK 7;CHR$ (ch+144):
IF q=5 THEN GO TO 300
 250 LET q=q+1
 260 IF x=(c*8)+4 THEN GO TO 280
 270 GO TO 205
 280 FOR n=-3 to -1: PRINT AT b,c; INK 1; INVERSE 1;CHR$ (ch+144):
BEEP .04,5-n: PRINT AT b,c; INK 2;CHR$ (ch+144): BEEP .04,n:NEXT n
 290 LET s=s+(b*(ch*2)): PRINT AT 0,8; BRIGHT 1; INK 5;s:
PRINT AT b,c;" ": GO TO 150
 300 PRINT AT 10,12; INK 7;"Game Over": IF s>=ss THEN LET ss=s:
PRINT AT 0,21; BRIGHT 1; INK 5;ss
 305 GO SUB 600
 310 PRINT AT 12,6; INK 6;"Press Y to play again"
 320 IF INKEY$="y" THEN CLS: BEEP .3,30: GO TO 70
 330 IF INKEY$="n" THEN CLS: STOP
 340 GO TO 320
 350 DATA BIN 00000000,BIN 00011000,BIN 00011000,BIN 10011001,
BIN 10011001,BIN 11111111,BIN 10000001,BIN 10000001
 360 DATA BIN 00111100,BIN 01111110,BIN 11011011,BIN 01111110,
BIN 01011010,BIN 10000001,BIN 01000010,BIN 00100100
 370 DATA BIN 00111100,BIN 00100100,BIN 00111100,BIN 01111110,
BIN 11111111,BIN 00100100,BIN 01000010,BIN 10000001
 380 BORDER 2:PAPER 2:INK 7:CLS
 390 PRINT "ALIEN BLASTER": PRINT AT AT 0,0;OVER 1;
"-------------"


 400 PRINT AT 2,0;"The Aliens are invading your ";AT 4,1;
"system, your only hope is to";AT 6,1;"blast them before they land";
AT 8,1;"and colonise the Earth !"
 410 PRINT AT 10,1; INVERSE 1; INK 7; FLASH 1;"WARNING..."
 420 PRINT AT 12,1;"ONLY FIVE ALIENS HAVE TO LAND";AT 14,1;
"TO TAKE OVER !!!"
 430 PRINT AT 21,1;"Press any key for next page"
 440 BEEP .1,15: BEEP .1,21 : IF INKEY$="" THEN GO TO 440
 450 CLS
 455 PRINT "ALIEN BLASTER": PRINT AT 0,0;OVER 1;
"-------------"
 460 PRINT AT 2,0;"To move base right press ";INVERSE 1;"'2'"
 470 PRINT AT 4,0;"To move base left press ";INVERSE 1;"'1'"
 480 PRINT AT 6,0;"Press ";INVERSE 1;"'0'";INVERSE 0;" to fire":
PRINT AT 9,0;"There are two different aliens, one scores more than
the other".
 485 PRINT AT 12,0;"The aliens are worth more the nearer they are
to the planet."
 487 PRINT AT 15,5; INK 5;"B...Raider": PRINT AT 17,5;
" INK 4;"C...Droid"
 490 PRINT AT 21,1;"Press any key to start"
 500 BEEP .2,5: IF INKEY$<>"" THEN GO TO 100
 510 GO TO 500
 520 BORDER 2: PAPER 2: INK 7: CLS
 530 PRINT AT 10,9;"Alien Blaster"
 540 FOR n=-10 TO 40
 550 BEEP .1,40-n
 560 NEXT n: PAUSE 2: BEEP .5,20: BEEP .1,15: RETURN
 600 FOR n=0 TO 2: BEEP .1,10: BEEP .1,15: NEXT n
 610 FOR n=20 TO 0 STEP -2
 620 BEEP .1,n: NEXT n
 630 PAUSE 3: BEEP .25,15: BEEP .25,15
 640 RETURN
1000 LET c=c-1: RETURN
2000 LET c=c+1: RETURN
3000 RETURN
```

SPECTRUM BLASTER

BY ALAN GREEN

Well, yes, it is another space-invader type game, but it has redeeming features. It demonstrates many of the special features of the Spectrum, including colour (BRIGHT, FLASH, INVERSE, etc), sound (OK, BLEEP) and user-defined graphics.

The program runs on both 16K and 48K machines and contains full instructions: the usual 'blast the aliens before they kill your grandmother and eat your pet dog'.

Please note that the 'A', 'B' and 'C' in lines 40, 50, 60, 160 and 212 respectively should be entered as graphics A, B and C. Thanks to Neil Marshall for the modifications in lines 212 and 214.

*Insert line 35 LET SS=450

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GAME Adventure in 1K

ADVENTURE IN 1K

BY IAN STANSFIELD

This is the ultimate transportable program. With an absolute minimum of adaptation (or none at all) it will run on any micro you might care to name, apart from those which don't support Basic – but there is only one of those at present. In fact, its transportability is quite sickening.

It is a whole adventure in well under 1K of memory. It will provide hours of fun and entertainment for all the family – as long as they are either schizoid or possessed of an IQ below 30. It is also very easy to understand and modify. Just key it in and RUN.

For the connoisseur, there is also a version written in C, for the sake of a little linguistic variety.

```
10 REM******1k ADVENTURE*****
20 PRINT "YOU ARE IN A CAVERN"
30 PRINT "NORTH, SOUTH, EAST OR WEST?"
40 INPUT A$
50 GOTO 20
```

```
 C VERSION
-----------

    main()
    (
    char c;
    START
    printf("You are in a cavern...\n");
    printf("North,South,East or West");
    c=getchar()
    goto start;
    )
```

WESSEXSOFT 16 EASTLAKE AVE PARKSTONE POOLE DORSET

STAR TREK (Vic 20)
A 16K adventure type of program with instructions. Take charge of the Enterprise and go out into space in Search of the Klingons.

With full use made of the sound and colour on the Vic and updated information displayed on the screen all the time it becomes a game of intrigue and strategy to outwit your enemy.

Using your warp engines to move around the galaxy and its 64 quadrants to find the Klingons and starbases. Repair and re-fuel your ship. Load up with torpedoes and continue your search.

The 10 levels of play will enable the game to be played in varying degrees of difficulty giving you fewer starbases and more Klingons to destroy. The more damage you receive from the Klingons in combat the more difficult it becomes to defend yourself.

A game of skill and cunning at £9.50 including p/p.

STAR RUN (Vic 20) 16K
You are the pilot of the freighter XR8 loaded with vital equipment for the satellite planet Amethos 10 which is trying to fend off an invasion of aliens from penetrating the inner galactic empire. The satellite planet has developed a malfunction in its gyroptic stabilizers which is causing the planet to spin erratically.

The aliens will try to stop you reaching Amethos 10 but should you run the gauntlet safely then you must land in a docking bay without crashing. The controls are switched over to the cursor controls or joystick.

The XR8 has two laser cannons to help defend itself and in combat the XR8 may be damaged. There are bases along the way to re-fuel and repair.

Not an easy game to play.

There are 9 levels of play and if you found Star Trek easy then this one is for you. £9.50 including p/p.

ALARIANS REVENGE
A fast moving game of wizards and goblins based on a fable. Find the amulet and its stones and save the kingdom from monsters and the evil sorcerer. A very complex game of skill and the facility to save the game to tape has been included to enable the player to re-load at any time and continue where they left off.

A 16K game using U.D.G. full colour and sound. £9.50 including p/p.

SPRITEMASTER (CBM 64)
This program for the 64 will allow the creation of graphics on the screen. This is done one at a time so that they can be changed if desired. The colours can be arranged at the same time. The sprites can be moved around the screen using cursor controls. This helps to give some idea of what the finished creation will look like in certain positions on the screen. It also gives an idea of what the created character will look like in motion.

The sprites can be saved as data to some designated high line numbers and merged with your own program. The program can then be re-numbered to save memory. £6.50 including p/p.

SYNTHESISER (CBM 64)
A program to turn your 64 into a full synthesiser. The range includes three octaves on the first voice. Sustain, attack and decay are used to make the sound very real.

The waveforms can be changed in mid tune by the use of the function key.

It is not even necessary to be able to read music but it helps. £4.50 including p/p.

GET YOUR CARDS RIGHT (16-48K Spectrum)
A card game based on the television series where the cards appear face down. The player must decide if the following cards are higher or lower. There is an amount of money to gamble. Wins are paid on getting all the cards right but bonuses are paid for pairs etc.

User defined characters have been used to add realism and the game is ideal for younger players (average age is 10 years). £4.00 including p/p.

PEG IN THE MIDDLE (14-16K Spectrum)
A game of solitaire with the option of horizontal/vertical moves or incorporating diagonal moves for the less experienced player. After 3 attempts to move a blind the player is asked if they want to see a solution.

All legal moves have been covered and it is not possible to cheat.

A game for all ages and not as easy to complete as you would think. £4.00 including p/p.

Peg in the Middle/Get Your Cards Right double package at £6.00 for the two.

GEM SOFTWARE

MONSTER MINE by W.E. MacGowan
Escape from the mine, with as much money as you can, but don't get shut in, or caught by the prowling monsters. A very addictive machine code game, with superb graphics and high-score tape-save facility.

Price (Dragon & Lynx)	**£7.95**
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GOLF by Pete Allen
An excellent Basic program, giving you an 18 hole course with handicaps and choice of clubs. A golfing weakness must be specified. Amazing full colour graphics and sound!!

Price (Dragon & Lynx)	**£7.95**

SULTAN'S MAZE by Christopher Hunt
Enter the 3D Maze in search of the Sultan's jewels, but beware, your strength may run out, or, you may come face to face with the Mad Guardian's ghost. A multi-difficulty level game with fantastic graphics and sound.

Price (Dragon & Lynx)	**£7.95**

GAMES PACK III by Christopher Hunt

REVERSI	Pit your wits against the Lynx with this easy to learn yet extremely demanding board game. Five skill levels, from novice to grand master.
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SNAKE	Guide the snake to the food, but watch out, he will grow and must not eat the wall or himself.
Price (Lynx)	**£7.95**

GEMPACK IV by W.E. MacGowan
Two great machine code action games, with full colour graphics. In SEA HARRIER you must land your plane on the aircraft carrier, after dispersing the clouds with chemical bombs, but don't hit the ship!! In SUB CHASE you must depth charge the wolf pack without being sunk. Both with 4 levels of play from easy to kamikaze.

Price (Dragon & Lynx)	**£7.95**

LYNX COMPUTING by Ian Sinclair
Excellent book which the beginner will find an invaluable aid, in helping to unravel the LYNX's many varied features!!

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GAME Engine Failure
MACHINE BBC

BBC ENGINE FAILURE

BY IAN WATT

This adventure game will run on either a model A or model B BBC computer.

As adventures go, it is not stunningly unusual but it is fun to play. As with all decent adventures, you need a modicum of patience – but that never did anyone any harm. It has to be said that you can cheat by following the listing closely, but the penalty there lies with your own conscience ...

By way of an outline, you are in a spaceship whose engines have failed while orbiting a planet. The fact that you are in orbit means that you are in danger of burning to a crisp in the planet's atmosphere in just a few minutes. You are the hero/heroine whose job is to repair the ship and save the lives of all the grateful crew.

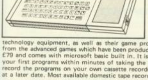
You must move throughout the ship and on to the planet, picking up objects (which may or may not be useful) as you go. The computer is not above offering its help if you ask it nicely.

```
   10 REM ENGINE FAILURE BY IAN R. WATT
   20 REM AN ADVENTUTE FOR A BBC MICRO
   30 DIM E(19)
   40 MODE 7:X=0:W=0
   50 CLS:PRINT'''CHR$129"Do you want instructions(Y or N) ?";:
Z$=GET$:IF Z$="N" THEN 200 ELSE IF Z$="Y" THEN 60 ELSE 50
   60 CLS:VDU 31,0,12,130:PRINT "If the caps lock is not on then put
it"CHR$130"on".
   70 FOR Z= 1 TO 5000:NEXT Z
   80 CLS:PRINT'CHR$131" You are orbiting round a planet when  "
CHR$131"the engines fail."
   90 FOR Z = 1 TO 5000: NEXT Z
  100 PRINT'CHR$132"You have a limited time before the ship"CHR$132
"burns up in the atmosphere in which to "CHR$132"repair the engines."
  110 FOR Z = 1 TO 7500:NEXT Z
  120 PRINT'CHR$133"You have to direct the computer to   "CHR$133
"manipulate the objexts you may come    "CHR$133"across."
  130 FOR Z = 1 TO 7500:NEXT Z
  140 PRINT'CHR$134"The computer has a fairly large number"CHR$134
"of commands therefore if one command   "CHR$134"does not work
then try another."
  150 FOR Z = 1 TO 10000:NEXT Z
  160 PRINT'CHR$130" The program is designed so that only   "CHR$130"
"the first three letters of each command"CHR$130"and object need be
typed in, although, if"CHR$130"desired, the full word may be entered."
  170 PRINT'CHR$131 "N.B. To move , simply type the initial"
  180 PRINT'CHR$134 " eg. N for North."
  190 FOR Z = 1 TO 15000:NEXT Z
  200 RESTORE 1370:FOR I = 1 TO 19:READ z:E(Z)=z:NEXT Z
  210 CLS:A=1:L=0
  220 RESTORE
  230 W=W+1:IF W>20 AND W<40 THEN PRINT"It is becoming warm."
  240 IF W>39 AND W<60 THEN PRINT "It is hot."
  250 IF W>59 AND W<80 THEN PRINT "It is very hot."
  260 IF W>79 THEN PRINT "The ship is burning up."
  270 IF W=100 THEN PRINT "The ship has blown up.":GOTO 850
  280 IF A=5 AND E(10)<>0 THEN PRINT "You have been shot by guards.":
GOTO 850
  290 IF (E(16)<>16 OR E(17)<>16) AND A=5 THEN PRINT "You have caught
a lethal disease.": GOTO 850
  300 FOR B=1 TO A:READ A$:NEXT
  310 VDU 31,0,3,130:PRINT A$
  320 PRINT'CHR$131"Evident exits:- ";:RESTORE 580:FOR C = 1 TO A:
READ D:NEXT:IF D <> 0 THEN PRINT ":North:";
  330 RESTORE 590:FOR C = 1 TO A:READ D:NEXT:IF D<>0 THEN PRINT":South:";
  340 RESTORE 600:FOR C = 1 TO A:READ D:NEXT:IF D<>0 THEN PRINT":East:";
  350 RESTORE 610:FOR C = 1 TO A:READ D:NEXT:IF D<>0 THEN PRINT":West:";
  360 PRINT''CHR$132"Objects:- ";
  370 H=0:RESTORE 730
  380 FOR G=1 TO 19:READ C$:IF E(G)<>A OR H=4 THEN NEXT ELSE PRINT":";
C$;":";:H=H+1:IF H<>2 THEN NEXT ELSE PRINT '"            "CHR$132;:NEXT
  390 PRINT ''CHR$133"Inventory:- ";
  400 F=0:RESTORE 730
  410 FOR G=1 TO 19:READ C$:IF E(G)<>0 AND E(G)<>-1 OR F=4 THEN NEXT
ELSE PRINT":";C$;":";:F=F+1:IF F<>2 THEN NEXT ELSE PRINT"            "
CHR$133;:NEXT
  420 VDU 31,0,13,129:PRINT"[------------------------------------]"
  430 VDU 31,0,17,129:PRINT"[------------------------------------]":
VDU 31,0,15,134
  440 INOUT"Command? "B$
  450 CLS:VDU 31,1,19
  460 IF LEFT$(B$,3)="WEA" OR LEFT$(B$,3)="ENT" OR LEFT$(B$,3)="EXI"
OR LEFT$(B$,3)="EAT" THEN 620
  470 IF LEFT$(B$,1)<>"N" THEN 490 ELSE RESTORE 580:FOR C=1 TO A:
READ D:NEXT:IF D=0 THEN 530 ELSE 520
  480 IF LEFT$(B$,1)<>"S" THEN 490 ELSE RESTORE 590:FOR C=1 TO A:
READ D:NEXT:IF D=0 THEN 530 ELSE 520
  490 IF LEFT$(B$,1)<>"E" THEN 500 ELSE RESTORE 600:FOR C=1 TO A:
READ D:NEXT:IF D=0 THEN 530 ELSE 520
  500 IF LEFT$(B$,1)<>"W" THEN 510 ELSE RESTORE 610:FOR C=1 TO A:
READ D:NEXT:IF D=0 THEN 530 ELSE 520
  510 GOTO 620
  520 A=A+D:IF A=12 THEN 1080 ELSE 220
  530 PRINT"No exit!"
  540 GOTO 220
  550 DATA Control room,Living quarters,Medical quarters,
Teleport terminal,Mine on planet
  560 DATA Computer storage banks,Cargo hold,Shuttle bay,
Inside of shuttlecraft,Engine servicing room
  570 DATA Weaponry,Right engine,Left engine,Supply depot,Workshop
  580 DATA 0,-1,0,0,0,3,0,0,0,-3,0,0,-2,0,0
  590 DATA 1,0,3,0,0,0,3,0,0,0,2,0,0,0,0
  600 DATA 0,1,0,-2,0,1,0,-2,0,0,-3,-2,0,-3,-2
  610 DATA 0,2,-1,0,0,2,-1,3,0,2,3,0,2,0,0
  620 M=0:N=0:D=0:IF LEFT$(B$,3)="TEL" THEN 860 ELSE IF LEFT$(C$,3)=
"QUI" THEN 850 ELSE IF LEFT$(B$,3)="HEL" THEN 1040
  630 RESTORE 760:FOR I=1 TO 11:READ C$:IF LEFT$(B$,3) = C$ THEN M=I
```

➡79

HOME COMPUTERS

AQUARIUS



AQUARIUS: The brand new Aquarius Personal Computer is part of Mattel Electronics latest developments in advanced technology and offers full home computing facilities, as well as extensive game play, using a very wide range of plug in cartridges. Since Aquarius is a Mattel Electronics product, it benefits by the company's wide experience of producing high technology equipment, as well as their game programming expertise which is evident from the advanced games which have been produced for the Intellivision. Aquarius costs £79 and comes with microsoft basic built in. It is so simple to use that you'll be writing your first programs within minutes of taking the machine out of its box. You can even record the programs on your own cassette recorder at home, so you can use them again at a later date. Most available domestic tape recorders are compatible with the Aquarius.

A POWERFUL MACHINE: For all its simplicity, it is also very sophisticated. It has a Z80A processor and 8K of built in ROM as well as 4K of RAM, which is user expandable to 52K. It has a display of 40 x 24 characters, and a graphic resolution of 320 x 192 with a total character set of 256 (including the complete ASCII set with upper and lower case letters, numbers and additional graphic symbols). The keyboard has 49 full stroke moving keys, unlike some of the cheaper machines which have membrane keyboards. The size of the machine (excluding any of the additional peripherals), is 13" x 6" x 2".

PERIPHERALS: It is very easy to increase the capabilities of your Aquarius as all the peripherals plug straight into one another. You can add a Printer, a Modem, a Data Recorder, Mini Expander and other items. All of the peripherals are very easy to install and what is more, they're easy to use. But the best news of all is, they're easy to afford.

CPM OPERATING CAPABILITY: The Aquarius is capable of being expanded to 52K RAM and later in 1983 a disk drive will be available for it, with the commercial CPM business operating system. This will allow you access to one of the largest software libraries in the world, with literally hundreds of programs available for you to use.

CARTRIDGES: Various sophisticated programs will be launched on plug in cartridges such as a Visicalc type spreadsheet and a word processor. In addition there will be dozens of games and utilities and alternative languages such as Logo, which combined with the built in microsoft basic gives an unbeatable combination of high quality programming ability.

MATTEL AQUARIUS – £68.70 + VAT = £79

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SPECIFICATIONS: Both the Atari 400 and 800 can display in up to 16 colours, each with 16 intensities. They have four independent sound synthesizers for music tunes/game sounds, giving four octaves with variable volume and tone control on your T.V.'s speaker. The display graphics are of amazing quality, having a detailed resolution of 320 x 192, comprising 24 lines of 40 characters. Atari personal computers have a standard 10K ROM operating system. In addition the standard Atari 400 (£149) comes with 16K of RAM, and the expanded version with 48K (£198). The Atari 800 (£299) comes with 48K as standard. Both the 400 and 800 are now supplied with a FREE £40 Basic Programming Kit, which includes the Basic Programming Cartridge, as well as a 120 page Basic Reference Manual and the 184 page Self Teaching Manual by Bill Carris called 'Inside Atari Basic', so you can begin programming straight away, without buying any 'extras'. Even a mains plug is supplied!

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100 FREE PROGRAMS FROM SILICA SHOP: If you buy your Atari Home Computer from Silica Shop, you will recieve a FREE presentation pack of 6 cassettes, containing 100 programs including games, utilities and demonstrations. A 16 page booklet giving full details of all of these programs is available on request. If you have already purchased your computer elsewhere you can buy the set of 6 cassettes for £30. What's more, Silica Shop offer a two year guarantee on all computers as well as a FREE joystick. This adds up to a great offer that we believe can't be beaten or matched by any of our competitors.

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VIDEO GAMES

COLECOVISION

THE SYSTEM: The CBS Colecovision offers new standards in video game play. The excellent graphics are well implemented with arcade titles such as Zaxxon, Lady Bug, Gorf, Wizard of Wor, Carnival, Mouse Trap and the lovable Smurfs. The console comes supplied with a three screen arcade quality version of DONKEY KONG. Parker and other companies have also announced ranges of cartridges for Colecovision, to further enhance the wide range of quality titles available for this new television games machine.

THE CONSOLE: The CBS Colecovision video games system has advanced technology which produces superlative graphics resolution and excellent sound effects. The styling of the console and hand controllers has been carefully researched; the console is designed to complement modern hi-tech equipment, and has clear features for easy operation. The hand controllers allow fingertip control via the 8 direction joystick, and feature 2 independent fire buttons. The push button keyboard is used for game selection and for game control with some cartridges. The hand controllers are detachable and are connected to six feet of telephone coil cable, storing neatly away in the console when not in use.

ATARI EXPANSION MODULE: The Atari converter module allows Atari VCS software cartridges to be played on the Colecovision console, allowing owners the freedom to purchase from the extensive range of Atari compatible cartridges. It also means that existing Atari owners can buy the CBS Colecovision games system without discarding their software library. Silica Shop offer part exchange facilities if you wish to upgrade.

TURBO EXPANSION MODULE: The Turbo Driver Expansion Module allows you to actually drive the vehicle that appears on your T.V. screen. The module consists of a steering wheel, dashboard and accelerator pedal. One hand controller is mounted on the dashboard to provide a gear change unit. The module comes complete with a Turbo Driver cartridge, the first of several cartridges to make use of the module, which provides all the action of sitting in the driving seat. This facility is unique to CBS Colecovision.

HOME COMPUTER EXPANSION MODULE: The Home Computer Module scheduled for late 1983, allows conversion of the games unit into a sophisticated Home Computer. This flexibility of design is an important feature of the CBS Colecovision System.

COLECOVISION - £127.82 + VAT = £147

£147

VECTREX

THE SYSTEM: Vectrex is a totally unique Home Arcade System, which has been exclusively designed and engineered to duplicate real arcade game play. Complete with its own monitor display, Vectrex won't cause any arguments over the use of the family's television because it has its own built in screen.

THE SCREEN: Vectrex does not use ordinary display techniques, instead it uses vector scanning to control the images on the screen. With this scanning method, the gun only updates the area of the screen that has changed, whereas a normal T.V. re-transmits the ENTIRE screen 50 times a minute. It is this that gives Vectrex its speed, and means that very little computer power is required for screen control, and the results provide very fast responding and clear images. These 'Vector Graphics' are used in several arcade games such as Asteroids and Battlezone, to give you incredibly high resolution and quality. Vectrex brings all of this from the arcade right into your living room. The Vectrex screen is capable of displaying 80 columns by 40 lines, which is significant to the extensive developments planned for the system.

EXCITING SOUNDS AND ELECTRONICS: Vectrex has an advanced microprocessor with more speed and power and exciting effects than many home video games systems.

REAL ARCADE CONTROLS: Vectrex has a unique control panel, similar to those used in many real arcade games, with 4 concave action buttons and a full 360° self centering joystick. This control panel has a 4 foot detachable cord for maximum player freedom.

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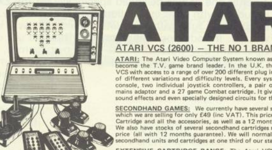
VIDEO GAMES

ATARI



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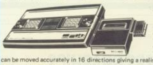

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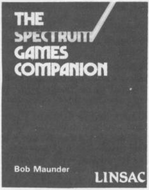

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Bob Maunder is co-author of 'The ZX80 Companion' and author of 'The ZX81 Companion'. He is a Senior Lecturer in Computer Science at Teesside Polytechnic, holds an MSc degree in Computer Science, and is a Member of the British Computer Society.

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GAME Engine Failure
MACHINE BBC

```
 640 NEXT I:IF M<>0 THEN 660
 650 PRINT"I do not understand you.":GOTO 220
 660 RESTORE 730:D$=RIGHT$(B$,3):FOR J=1 TO 19:READ C$:C$=LEFT$(B$,3)
 670 FOR K=4 TO 15:IF LEFT$(D$,1)<>" " AND C$=MID$(D$,2,4) THEN N=1
 680 IF C$=MID$(D$,2,4) THEN O=J ELSE D$=RIGHT$(B$,K)
 690 NEXT K:NEXT J:IF O<>0 THEN 700 ELSE PRINT "Pardon?":GOTO 220
 700 IF N=1 THEN PRINT"Learn to type."
 710 ON M GOTO 780,890,940,970,1090,1130,1170,1200,1240,1270,1300
 720 GOTO 220
 730 DATA BLUE BUTTON,RED BUTTON,YELLOW BUTTON,LIGHT-BLUE,LIGHT-RED,
LIGHT-YELLOW
 740 DATA ASTRAGEM,SHUTTLECRAFT,FLOPPY DISK,ZAPPERGUN,SPACESUIT,
SCREWDRIVER,PANEL,LEVER
 750 DATA JEWEL-SOCKET,WATER,TABLET,PLIERS,PCB
 760 DATA PRE,GET,DRO,INS,WEA,ENT,EXI,UNS,PUL,DRI,EAT
 770 PRINT "I cannot do that.":GOTO 220
 780 IF O<>3 THEN 770
 790 IF O=2 AND E(15)=16 THEN 1330
 800 IF O=2 AND E(5)<>1 OR O=1 AND E(4)=1 OR O=3 AND E(6)=1
THEN PRINT"The ship has blown itself up.":GOTO 850
 810 IF O=3 AND E(4)=1 THEN PRINT"A yellow light comes on.":
E(4)=16:E(6)=1:GOTO 220
 820 IF O=1 AND E(6)=1 THEN PRINT"A pcb has just materialised in part
of the ship.":E(16)=16:E(19)=10:GOTO 220
 830 IF O=1 OR O=3 THEN PRINT"Nothing happens.":GOTO 220
 840 PRINT"The teleport has been activated.":L=1:E(5)=16:GOTO 220
 850 VDU 23;11,0;0;0;0;31,5,23:PRINT"Press space to start again.":
IF INKEY$(50)=" " VDU 23;11,255;0;0;0;:GOTO 40 ELSE VDU 31,5,23:
PRINT"                                  ":IF INKEY$(50)=" " VDU 23;11;255;0;0;
0;:GOTO 40 ELSE 850
 860 IF L=0 OR A<> 4 AND A<>5 THEN 770
 870 IF A=4 THEN A=5 ELSE IF A=5 THEN A=4
 880 PRINT"O.K.": GOTO 220
 890 IF O<7 OR O=8 OR O=13 OR O=14 OR O=19 THEN 770
 900 IF F=4 THEN PRINT"I am carrying too much.":GOTO 220
 910 IF E(O)<>A THEN 930
 920 E(O)=0:GOTO 880
 930 PRINT "I do not see it here.":GOTO 220
 940 IF E(O)<>0 AND E(O)<>-1 THEN PRINT "I am not carrying it.":GOTO 220
 950 IF H=4 OR A=1 THEN PRINT"I  do not see a place to put it.":GOTO 220
 960 E(O)=A:GOTO 880
 970 IF O<>9 AND O<>7 AND O<>15 THEN 770
 980 IF E(O)<>0 AND E(O)<>-1 THEN PRINT"I do not have it to insert.":
GOTO 220
 990 IF A<>1 AND O=9 OR O=7 AND E(15)<>0 OR O=15 AND A<>10 THEN PRINT
"I do not see a place to insert it.":GOTO 220
1000 IF O=7 THEN E(O)=16:E(15)=-1:GOTO 880
1010 IF O=9 THEN 1030
1020 IF O=15 AND E(18)=0 THEN E(O)=16 ELSE 770
1030 PRINT "A red light comes on.":E(5)=1:E(4)=16:E(9)=16:GOTO 220
1040 IF A=9 AND E(9)=0 THEN PRINT "Try inserting the floppy disk.":
GOTO 220
1050 IF A=13 THEN PRINT"Try unscrewing the panel.":GOTO 220
1060 IF A=2 OR A=3 THEN PRINT"A tablet taken with water prevents the
catching of a lethal disease.":GOTO 220
1070 PRINT"There is no help available to give.":GOTO 220
1080 PRINT "Your pet ORIGONK has mistaken you for an intruder and
killed you.":GOTO 850
1090 IF O<>11 THEN 770
1100 IF E(O)<>0 AND E(O)<>-1 THEN PRINT"I am not carrying it.":GOTO 220
1110 IF E(O)=-1 THEN PRINT"I am already wearing it.":GOTO 220
1120 E(O)=-1:GOTO 880
1130 IF O<>8 THEN 770
1140 IF A<>8 THEN 930
1150 IF E(11)<>-1 THEN PRINT"You have been destroyed by nerve gas.":
GOTO 850
1160 A=9:GOTO 220
1170 IF O<>8 THEN 770
1180 IF A<>9 THEN PRINT"I am not inside it.":GOTO 220
1190 A=8:GOTO 220
1200 IF O<>13 THEN 770
1210 IF A<>13 THEN 930
1220 IF E(12)<>0 THEN PRINT"I need a screwdriver.":GOTO 220
1230 E(14)=13:E(13)=16:GOTO 880
1240 IF O<>14 THEN 770
1250 IF E(14)<>A THEN 930
1260 PRINT "A blue light comes on.":E(4)=1:E(5)=16:GOTO 220
1270 IF O<>16 THEN 760
1280 IF E(O)<>0 THEN PRINT "I do not have any water.":GOTO 220
1290 E(O)=16:GOTO 880
1300 IF O<>17 THEN 760
1310 IF E(O)<>0 THEN PRINT"I do not have a tablet.":GOTO 220
1320 GOTO 1290
1330 PRINT "Congratulations----The ship is now fully operational."
1340 Q=100-W:IF Q>X THEN X=Q
1350 PRINT'"Score=";Q;"   Best score=";X
1360 GOTO 850
1370 DATA 1,1,1,16,16,16,5,8,6,11,14,9,13,16,15,2,3,7,16
```

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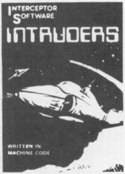
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ATARI FLASHBACK

BY G CHEUNG

This game is rather like the well known Simon Says game. It uses good colour and sound, and provides a full range of difficulty levels.

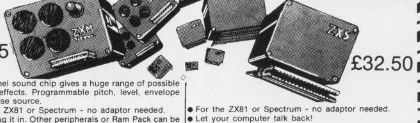
As it runs in under 16K it is ideal for either Atari 400 or 800. Depending on the level of difficulty, between four and eight numbers are displayed in coloured rectangles.

These flash in a random sequence, together with a sound of characteristic pitch. The player then has to follow the sequence by pressing the right numeric keys. As the game goes on, the sequences get longer. A high score of number sequences remembered is kept.

As a program it is nicely written, and it uses machine code to speed up responses to input. The flashing numbers are produced by POKEing directly into screen RAM.

```
 10 REM**FLASHBACK BY GWK CHEUNG
 20 REM
 30 DIM A$(1),P$(19),Z$(19),N(18),P(8),NB(8),NW(8),NT(8):GOTO 90
 40 REM
 50 REM **SR FOR RANDOM NUMBERS
 60 FOR J=1 TO N:N(J) = INT(RND(0)*L+1):NEXT J:RETURN
 70 REM
 80 REM **SETTING UP MUSIC NUTES
 90 FOR J=1 TO 8:READ F1:NT(J) = F1:NEXT J:DATA 31,63,95,127,159,
191,223,255
 100 REM
 110 REM **M/C TO SET UP PLAYERS
 120 FOR J=1 TO 19:READ P8:P$(J,J) = CHR$(P8):NEXT J:Z$ = P$:
Z$(9,9) = CHR$(255): Z$(16,16) = CHR$(60)
 130 DATA 104,104,133,204,104,133,203,169,0,160,0,145,203,200,
192,255,208,249,96
 140 HS = 0:REM **RESET HIGH SCORE
 150 GOSUB 620
 160 L = LEV*2:N = LEV*3 :GOSUB 60
 170 REM
 180 REM ** SET UP DISPLAY FOR GAME
 190 GRAPHICS 18:POKE 710,0: POKE 711,15
 200 REM
 210 REM **NB (J) = NUMBERS IN BLACK NW(J) = NUMBERS IN WHITE
 220 FOR J=1 TO 8:NB(J)=144+J:NW(J)=208+J:NEXT J
 230 REM
 240 REM ** POSITICN OF NUMBERS ON SCREEN
 250 S=PEEK(560)+256*PEEK(561)+4: S=PEEK(S)+256*PEEK(S+1)
 260 FOR J=1 TO 4:P(J)=S+60+4*J: P(4+J)=S+140+4*J: NEXT J
 270 FOR J=1 TO L:POKE P(J),NB(J):NEXT J
 280 POSITION 5,0:? #6; "flashback":POSITION 2,10:? #6;
"HIGHSCORE=";HS
 290 REM
 300 REM ** SOUND VIBRATIONS
 310 GOSUB 1000:SOUND 0,0,0,0:POKE 53768,4:POKE 53761,168:
POKE 53765,168:POKE 53760,254:POKE 53764,123
 320 REM
 330 ** MOVIAG PLAYERS
 340 FOR I=1 TO X4 :POKE 53251,I:NEXT I
 350 FOR I=1 TO X3 :POKE 53250,I:NEXT I
 360 FOR I=1 TO X2 :POKE 53249,I:NEXT I
 370 FOR I=1 TO X1 :POKE 53248,I:NEXT I
 380 SOUND 0,0,0,0:FOR I=70 TO 0 STEP -1:SOUND 2,I,10,10:NEXT I
 390 GOSUB 1160
 400 K=1
 410 REM
```

➡83



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```
 420 REM ** COMPUTER SEQUENCE DISPLAY
 430 FOR J=1 TO K
 440 POKE P(N(J)),NW(N(J)):JJ=N(J):GOSUB 1190:POKE P(N(J)),NB(N(J)):
GOSUB 1230:NEXT J
 450 REM
 460 REM **PLAYER SEQUENCE INPUT
 470 OPEN #1,4,0,"K:":POKE 764,255:FOR J=1 TO K
 480 GET #1,X:IF X<49 OR X>L+48 THEN 480
 490 Y=X-48:POKE P(Y),NW(Y):JJ = N(J):GOSUB 1190:POKE P(Y):NB(Y)
 500 IF Y<>N(J) THEN CLOSE #1:GOTO 800:REM ** CHECK FOR PLAYER ERROR
 510 NEXT J:CLOSE #1
 520 REM
 530 REM ** CHECK FOR END OF SEQUENCE
 540 K=K+1:IF K>N THEN GOTO 560
 550 GOSUB 1160:GOTO 430
 560 LEV=LEV+1:IF LEV>6 THEN 880

 570 L=LEV+2:N=LEV*3:GOSUB 60:
 580 FOR I=1 TO L:POKE P(L),NW(L):FOR D=1 TO 10:SOUND 0,NT(L),10,10:
NEXT D:SOUND 0,0,0,0
 590 POKE P(L),NB(L):FOR D=1 TO 10:NEXT D:NEXT I:T=T+K-1:
FOR D=1 TO 500:NEXT D:GOTO 400
 600 REM
 610 REM ** INITIAL DISPLAY
 620 GRAPHICS 3:POKE 710,146:POKE 712,146:POKE 752,1:LEV=1
 630 BE=PEEK(560)+PEEK(561)*256+4
 640 POSITION 1,1: ? "FLASHBACK BY GWK CHEUNG"
 650 POKE BE+2,7:POKE BE+3,6
 660 POSITION 2,3:? "FOLLOW THE COMPUTER BY HITTING KEYS 1-8
(DIRECT INPUT)."
 670 ? :? "THE GAME WILL BEGIN WHEN 4 RECTANGLES ARE DISPLAYED ON
THE SCREEN."
 680 ? :? "THE GAME IS OVER WHEN THE PLAYER MAKES AN ERROR OR HAS
SUCCESSFULLY REPEATED THE SERIES OF ";
 690 ? "NUMBERS AT THE FINAL LEVEL."
 700 ? :? :? "SELECT INITIAL LEVEL:"
 710 POSITION 1,16:? "LEVEL":POSITION 1,17:? "press start"
 720 POKE BE+18,6:POKE BE+19,6:POKE BE+20,6
 730 IF PEEK(53279)=5 THEN LEV=LEV+1:REM ** CHECK SELECT KEY
 740 IF LEV>6 THEN LEV=1
 750 POSITION 7,16:? LEV:N=6*LEV
 760 IF PEEK(53279)=6 THEN RETURN :REM ** CHECK START KEY
 770 FOR D=1 TO 50:NEXT D:GOTO 730
 780 REM
 790 REM **SCORE DISPLAYS
 800 GRAPHICS 18:POKE 53277,0
 810 POSITION 5,3:? #6;"AAAHHHH!!!":GOSUB 1100
 820 POSITION 2,7:? #6;SCORE ";T+K-1
 830 POSITION 2,9:? #6;"rats !!"
 840 GOSUB 1130:GOSUB 1160:FOR I=53248 TO 52351:POKE I,0:NEXT I
 850 T=0:GOTC 150
 860 REM
 870 REM ** REMOVE PLAYERS
 880 FOR I=0 TO X1:POKE 53248,X1-I:SOUND 0,X1-I,10,10:NEXT I
 890 FOR I=0 TO X2:POKE 53249,X2-I:SOUND 0,X2-I,10,10:NEXT I
 900 FOR I=0 TO X3:POKE 53250,X3-I:SOUND 0,X3-I,10,10:NEXT I
 910 FOR I=0 TO X4:POKE 53251,X4-1:SOUND 0,X4-I,10,10:NEXT I
 920 REM
 930 REM ** CONGRATULATE PLAYER
 940 GRAPHICS 18:POKE 710,146:POKE 712,146:POKE 53277,0
 950 POSITION 2,5:? #6;"WELL DONE!!"
 960 POSITION 2,7:? #6;SCORE ";T+K-1
 970 GOSUB 1130:GOSUB 1160:GOTO 150
 980 REM
 990 REM **P/M GRAPHICS SUBROUTINE FOR 4 RECTANGLES
1000 X1=67:X2=100:X3=133:X4=166
1010 A6 = PEEK(106)-16:POKE 54279,A6:PMB=256*A6
1020 POKE 623,4:FOR I=53256 TO 53259:POKE I,3:NEXT I
1030 POKE 559,46:POKE 53277,3
1040 FOR I=53248 TO 53251:POKE I,0:NEXT I
1050 D=USR(ADR(P$),PMB+512):D=USR(ADR(P$),PMB+768)
1060 POKE 704,98:POKE 705,22:POKE 706,182:POKE 707,70:REM **COLOURS
OF RECTANGLES
1070 D=USR(ADR(Z$),PMB+542):D=USR(ADR(Z$),PMB+670):D=USR(ADR(Z$),
PMB+798):D=USR(ADR(Z$),PMB+926):RETURN
1080 REM
1090 REM **ERROR SOUND EFFECTS
1100 FOR I=70 TO 196:SOUND 0,I,12,15:POKE 712,I:POKE 710,I:
NEXT I:SOUND 0,0,0,0:RETURN
1110 REM
1120 REM **UPDAATE HIGHSCORE


1130 IF T+K-1>HS THEN HS=T+K-1:RETURN
1140 REM
1150 REM **DELAY
1160 FOR D=1 TO 300:NEXT D:RETURN
1170 REM
1180 REM **MUSICAL NOTES
1190 FOR D=1 TO 16:SOUND 0,NT(JJ),10,15:NEXT D:SOUND 0,0,0,0:RETURN
1200 FOR I6=1 TO 6:SOUND 0,NT(JJ),10,15:NEXT I6:RETURN
1210 REM
1220 REM **FLASH DISPLAYS
1230 FOR D=1 TO 10:NEXT D:RETURN
```

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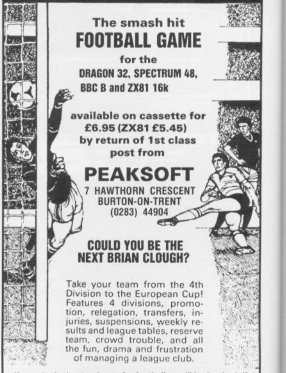

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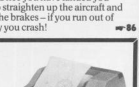
You can select the strength of wind against which you wish to fly. A zero cross-wind will make the landing easier as you will not have to use the 'roll' controls. Apart from roll, you control pitch and throttle. You can land safely only in certain control limits. Once you have landed you have to straighten up the aircraft and apply the brakes – if you run out of runway you crash!

➜86

```
   1 REM *** AIRCRAFT LANDING SIMULATOR ***
   2 REM *** BY P.C BAILEY ***
   3 REM *** DATE 3/7/82 ***
  10 GOTO 8000
  90 REM *** UTILITY SUBROUTINES ***
 100 REM *** SHORT DELAY ***
 110 FOR J = 1 TO 50 : NEXT J : RETURN
 200 REM *** LONG DELAY ***
 210 FOR J = 1 TO 500 : NEXT J :RETURN
 300 REM *** END OF PAGE ***
 310 PRINT : PRINT "PRESS <NEW LINE> TO CONTINUE";
 320 X$ = "" : X$ = INKEY$ : IF X$ = "" THEN 320
 330 IF ASC(X$) <> 13 THEN 320
 340 CLS
 350 RETURN
 400 REM *** CALCULATE COMPONENTS OF VELOCITY ***
 410 RA = AD * CI
 420 VX = AS * SIN(RA)
 430 VY = AS * COS(RA)
 440 RETURN
1000 REM *** APPROACH TO AIRFIELD
1010 GOSUB 5000
1020 GOSUB 2000
1030 IF PZ <= 0 THEN GOTO 1200
1040 GOSUB 4000
1050 GOSUB 5000
1060 GOTO 1010
1200 REM *** AFTER TOUCHDOWN ***
1210 GOSUB 3000
1220 IF LF = 1 THEN 1400
1230 PRINT @ 128, "TOUCHDOWN";
1240 GOSUB 5500
1250 GOSUB 6000
1260 GOSUB 4000
1270 IF LF = 2 THEN 1600
1280 IF LF = 3 THEN 1800
1290 GOTO 1250
1400 REM *** FATAL CRASH ***
1410 CLS
1420 X$ = "" : X$ = INKEY$ : IF X$ = <> "" THEN 1480
1430 PRINT @ 475, "FATAL CRASH";
1440 GOSUB 110
1450 PRINT @ 475, STRING$(12,32);
1460 GOSUB 110
1470 GOTO 1420
```



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```
1480 CLS :
     PRINT "THE FLIGHT RECORDER HAS BEEN RECOVERED"
1490 PRINT "THE FINAL FLIGHT DETAILS WERE AS FOLLOWS"
1500 GOTO 9000
1600 REM *** OFF RUNWAY AFTER GOOD LANDING ***
1610 CLS
1620 IF PY > 0 THEN
     PRINT "YOU HAVE GONE OFF THE END OF THE RUNWAY.":
     PRINT "TRY USING YOUR BRAKES NEXT TIME."
1630 IF ABS(PX) > WR THEN
     PRINT "YOU ARE OFF THE SIDE OF THE RUNWAY.":
     PRINT "ISN'T IT WIDE ENOUGH FOR YOU?"
1640 IF AS <= 10 THEN
     PRINT "LUCKILY THERE IS ONLY MINOR DAMAGE AT THIS SPEED"
1650 IF AS > 10 AND AS <= 25 THEN
     PRINT "SERIOUS DAMAGE TO YOUR AIRCRAFT, BUT YOU SURVIVE" :
     PRINT "TO SCARE YOUR PASSENGERS TO DEATH AGAIN"
1660 IF AS > 25 THEN
     PRINT "DISASTER - FATAL CRASH"
1670 PRINT
1680 PRINT "DETAILS OF THE FLIGHT WHEN YOU LEFT THE RUNWAY:-"
1690 GOTO 9000
1800 REM *** GOOD LANDING ***
1810 PRINT @ 128, "CONGRATULATIONS CAPTAIN - A SAFE LANDING";
1820 GOTO 9080
2000 REM *** UPDATE POSITION AND SPEED IN THE AIR ***
2010 PZ = PZ + GZ
2020 PY = PY + GY
2030 PX = PX + GX
2040 PT = PT + NC
2050 RL = RL + BC
2060 AS = AS + 2 * SGN( TS(TC) - AS )
2070 AD = AD + RL
2080 VZ = 1 * (TC - 5) *AS * SIN( PT + C1 )
2090 GOSUB 4000
2100 GZ = VZ
2110 GY = VY + WY
2120 GX = VX + WX
2130 GD = - ATN( VX/VY) * C2
2140 RETURN
3000 REM *** CHECK FOR CRASH ***
3010 IF ABS(RL) > RT
        OR PT > TF OR PT < 0
        OR ABS(AD) > RT
        OR AS < 45 OR AS > 55
     THEN LF = 1 :
        PRINT @ 128, "CRASH ON LANDING";
3020 IF ABS(PX) > WR OR PY > 0 OR PY < - LR
     THEN LF = 1 :
        PRINT @ 160, " OFF RUNWAY";
3030 GOSUB 2000
3040 RETURN
4000 REM *** UPDATE DISPLAY ***
4010 HT = -PZ-5 : LD = -PX-WR : RD = -PX+WR
4020 HD = HT*7 : IF HD < -PY THEN HD = -PY
4030 IF HD < 3000 THEN HD = 3000
4040 FOR I = 0 TO 4
4050 YD = -PY-I*500
4060 G(I,1) = LD : G(I+5,1) = RD
4070 G(I,2) = YD : G(I+5,2) = YD
4080 G(I,3) = HT : G(I+5,3) = HT
4090 NEXT I
4100 G(10,1) = -PX : G(10,2) = -PY : G(10,3) = HT
4110 G(11,1) = -PX : G(11,2) = -PY-LR : G(11,3) = HT
4120 A1 = 64/WR : A2 = 64.5 : A3 = 15.5 : A4 = 31
4130 FOR I = 0 TO 11
4140 AD = (HE-G(I,2))/HD
4150 R(I,1) = INT(G(I,1)*AD*A1+A2)
4160 R(I,2) = INT(A3*AD+A4)
4170 NEXT I
4180 ON ERROR GOTO 4250
4190 FOR I = 320 TO 896 STEP 64
4192 PRINT @ I, CHR$(30);
4194 NEXT I
4196 PRINT @ 960, STRING$(63,128);
4200 FOR I = 0 TO 11
4210 SET (R(I,1),R(I,2))
4220 NEXT I
4230 ON ERROR GOTO 0
4240 GOTO 4260
4250 RESUME NEXT
4260 PRINT @ 64, INT(AS*C5);
          TAB(9); INT(AD*C5);
          TAB(18);INT(PT*C5);
          TAB(27);INT(RL*C5);
          TAB(36);INT(PZ*C5);
          TAB(45);INT(ABS(PY)*C5);
          TAB(54);INT(PX*C5);
4270 RETURN
5000 REM *** CHECK CONTROLS ***
5010 X$ = ""
5020 X$ = INKEY$
5030 IF X$ = "" THEN RETURN
5040 IF ASC(X$) > 47 AND ASC(X$) < 58 THEN TC = VAL(X$) : RETURN
5050 IF X$ = "F" THEN BC = -1
5060 IF X$ = "G" THEN BC = 0
5070 IF X$ = "H" THEN BC = 1
5080 IF X$ = "M" THEN NC = 1
5090 IF X$ = "K" THEN NC = 0
5100 IF X$ = "O" THEN NC = -1
5110 RETURN
5500 REM *** CONTROLS AFTER LANDING ***
5510 X$ = ""
5520 X$ = INKEY$
5530 IF X$ = "" THEN RETURN
5540 IF X$ = "R" THEN RC = 1
5550 IF X$ = "E" THEN RC = -1
5560 IF X$ = "C" THEN RC = 0
5570 IF X$ = "B" THEN FD = 2
5580 RETURN
6000 REM *** AFTER TOUCHDOWN ***
6010 PT = 0 : RL = 0 : PZ = 0
6020 GOSUB 5500
6030 PX = PX + VX
6040 PY = PY + VY
6050 IF ABS(PX) > WR OR PY > 0 THEN LF = 2
6060 AD = AD + AD * (SGN(AD)+SGN(RC))
6070 AS = AS - FD : IF AS <= 0 THEN LF = 1
6080 GOSUB 4000
6090 RETURN
8000 REM *** INITIALISATION ***
8010 CLEAR 100 : DEFINT I-K
8020 DIM G(11,3), R(11,2)
8030 CLS : PRINT TAB(20); "AIRCRAFT LANDING SIMULATOR" : PRINT
8040 INPUT "DO YOU REQUIRE INSTRUCTIONS (Y/N)"; X$
8050 PRINT
8060 IF X$ = "N" THEN 8290 ELSE IF X$ = "Y" THEN 8080
8070 INPUT "PLEASE TYPE Y OR N"; X$ : GOTO 8060
8080 CLS
8090 PRINT
"IT IS DARK AND RAINING, YOU ARE APPROACHING THE AIRPORT WITH
300 PASSENGERS ON BOARD AND YOUR CO-PILOT HAS JUST BECOME
```

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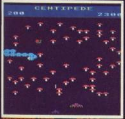
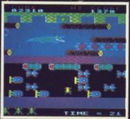


CENTIPEDE (32K) **£7.95 Cassette**
Incredible arcade type game featuring mushrooms, snails, flies, spiders and the centipedes of course. Excellent graphics and sound. 6 skill levels, hi-score, rankings, bonuses, and increasing difficulty as the spiders become more active and the number of mushrooms increases.

"Visually this game compares well with the arcade version, being colourful and clear."
... YOUR COMPUTER



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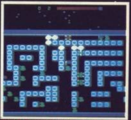
Not just another version of Frogger ... this is the proper high-quality version that you've been waiting for. Graphically brilliant, with gaping-mouthed crocodiles, diving turtles, and frogs that flex their legs as they jump along. Increasing difficulty, hi-score, responsive controls, sound effects, flies and bonus frogs.

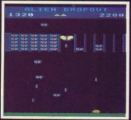
●●● *NEW RELEASE* ●●●



ROAD RUNNER (32K) £7.95 Cassette
The only full feature machine-code version of the arcade game available for the B.B.C. micro. Features include: scrolling screen, radar display, check-point flags, fuel gauge, smoke screens, 6 skill levels, rankings, increasing difficulty, and sound effects.

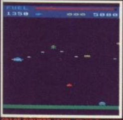
Suitable for use with keyboard or joysticks.

●●● *NEW RELEASE* ●●●



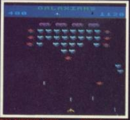
ALIEN DROPOUT (32K) £7.95 Cassette
Based upon the arcade game of ZYGON, but our version improves upon the original arcade game itself. You have to shoot the aliens out of their "boxes" before the "boxes" fill up. Once full, the aliens fly down relentlessly, exploding as they hit the ground. Suitable for use with keyboard or joysticks.

"Do not be fooled by their placid appearance – these moths are out to get more than the clothes in your wardrobe." . . . YOUR COMPUTER

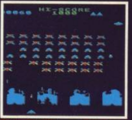


SPACE FIGHTER (32K) £7.95 Cassette
Arcade-style game based upon features from DEFENDER and SCRAMBLE. 5 types of menacing alien fire at you and may attempt to ram you. Separate attack phases, fuel dumps, repeating laser cannon, asteroids, smart bombs, hi-score, rankings, 6 skill levels, sound effects.

"A thoroughly enjoyable program, well worth the money ..."
... HOME COMPUTING WEEKLY.

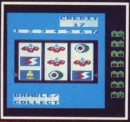


GALAXIANS (32K) **£7.95 Cassette**
Fast action version of the popular arcade game. 4 types of Galaxian (in 3 initial screen formations) swoop down individually or in groups of two or three. 6 skill levels, high score, rankings, bonus laser bases and increasing difficulty. Superb sound effects and graphics.



INVADERS (32K) **£7.95 Cassette**
Superb version of the old classic arcade game, including a few extras. 48 marching invaders drop bombs that erode your defences, and two types of spaceship fly over releasing large bombs that penetrate through your defences. Increasing difficulty, high score, superb graphics and sound.

"Both ... are well-produced, with colourful graphics, responsive controls and the usual bunch of extra-terrestrials." ... YOUR COMPUTER



FRUIT MACHINE (32K) £7.95 Cassette
Probably the best fruit machine implementation on the market. This program has it all ... HOLD, NUDGE, GAMBLE, spinning reels, realistic fruits and sound effects, multiple winning lines. This is THE fruit machine program to buy.

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PSSST Arcade standard, 100% machine code, incredible sound effects, amazing smooth high resolution visual graphics, and that totally new addictive concept and all those features you come to expect from the ULTIMATE GAME people.

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```
UNCONSCIOUS. SO YOU MUST LAND THE AIRCRAFT ALONE. TO BE HONEST"
8100 PRINT
"HE WAS NOT DOING A GREAT JOB BEFORE HE PASSED OUT.
YOU ARE IN LEVEL FLIGHT AT AN ALTITUDE OF 3000M BUT ONLY 20 KM
FROM THE FAR END OF THE RUNWAY. YOUR AIRCRAFT IS POINTING IN"
8110 PRINT
"THE CORRECT DIRECTION BUT ANY CROSSWIND WILL CAUSE A DEVIATION
FROM THIS PATH."
8120 GOSUB 510
8130 PRINT
"YOU MUST LAND WITH AN AIRSPEED OF ABOUT 50 M/S WITH NO
APPRECIABLE ROLL OR PITCH. ROLL MUST BE LESS THAN 3 DEGREES
AND PITCH BETWEEN 0 AND 5 DEGREES. SINCE THE RUNWAY IS 2000 M"
8140 PRINT
"LONG THE DISTANCE INDICATOR MUST SHOW LESS THAN THIS FIGURE ON
TOUCHDOWN. SIMILARLY THE RUNWAY IS 100 M WIDE SO THAT IF THE
DEVIATION IS GREATER THAN 50 M ON TOUCHDOWN YOU WILL MISS THE
RUNWAY."
8150 PRINT:PRINT
"AFTER TOUCHDOWN YOU MUST USE THE RUDDER TO CORRECT THE
DIRECTION OF TRAVEL AND THE BRAKES TO STOP BEFORE YOU REACH
THE END OF THE RUNWAY (THIS IS INDICATED BY A DISTANCE READING "
8160 PRINT
"OF 0). IF YOU  FAIL TO STOP OR TO CORRECT YOUR DIRECTION (WHICH
MAY NOT BE 0 WHEN LANDING IN A CROSSWIND) YOU WILL CRASH."
8170 PRINT : GOSUB 510
8180 PRINT
"YOU CAN SEE THE RUNWAY LIGHTS AHEAD AND IN THE DISTANCE THE
LIGHTS OF THE CITY YOU HOPE TO AVOID.
YOUR INSTRUMENTS GIVE THE FOLLOWING INFORMATION:

"
8190 PRINT
"AIRSPEED  SPEED IN M/S
BEARING   DIRECTION IN WHICH AIRCRAFT IS POINTING. 0 IS
          STRAIGHT AHEAD, POSITIVE VALUES TO THE RIGHT
PITCH     POSITIVE VALUES WHEN THE AIRCRAFT'S NOSE IS UP"
8200 PRINT
"ROLL      POSITIVE VALUES CLOCKWISE. ROLL CAUSES BANKING WHICH
          CHANGES THE AIRCRAFT'S BEARING.
ALT       HEIGHT ABOVE THE GROUND IN M.
DISTANCE  FROM FAR END OF THE RUNWAY IN M
DEV       SIDEWAYS DEVIATION FROM CENTRE OF RUNWAY"
8210 GOSUB 510
8220 PRINT
"IN FLIGHT YOU HAVE THE FOLLOWING CONTROLS:

F   ROLL TO LEFT
G   MAINTAIN ROLL AT THIS LEVEL
H   ROLL TO RIGHT
J   NOSE UP (INCREASE PITCH)
K   MAINTAIN PITCH AT THIS LEVEL
L   NOSE DOWN (DECREASE PITCH)

"
8230 PRINT
"0-9 THROTTLE CONTROL
     EACH SETTING HAS A TERMINAL VALUE OF SPEED WHICH IS
     REACHED EVENTUALLY. E.G. 5 - 150 M/S, 2 - 50 M/S.
     LANDING IS USUALLY ACHIEVED ON SETTING 2."
8240 GOSUB 510
8250 PRINT
"AFTER TOUCHDOWN ONLY THE FOLLOWING HAVE EFFECT:

C   RUDDER LEFT
R   RUDDER RIGHT
B   APPLY BRAKES

N.B. ALL CONTROLS HAVE A DELAYED EFFECT ON A LARGE AIRCRAFT."
8260 PRINT
"     IN GENERAL THEY HAVE AN EFFECT ON THE SECOND DISPLAY AFTER
     PRESSING A KEY.

GOOD LUCK.
"
8270 INPUT "DO YOU WANT TO SEE THESE INSTRUCTIONS AGAIN";X$
8280 GOTO 8060
8290 PI = 3.14159
8300 C1 = PI / 180 : C2 = 180 / PI
8310 C5 = .5
8320 LF = 0 : 'LANDING FLAG
8330 PZ = 3000 : 'ALTITUDE
8340 PY = -2E4 : 'DISTANCE FROM AIRFIELD (TO END OF RUNWAY)
8350 PX = 0 : 'LATERAL DEVIATION FROM GLIDE PATH
8360 RL = 0 : 'ROLL
8370 PT = 0 : 'PITCH
8380 AS = 150 : 'AIRSPEED
8390 AD = 0 : 'AIR DIRECTION
8400 GOSUB 400
8410 CLS
8420 PRINT
"PLEASE SELECT WINDSPEED AND DIRECTION. A DIRECTION OF 0 MEANS
THAT THE WIND IS BLOWING STRAIGHT AT YOU AND THIS GIVES THE
EASIEST LANDING SINCE YOU DO NOT NEED TO ALTER ROLL OR BEARING."
8430 PRINT
"THE DIRECTION SHOULD BE BETWEEN -90 (FROM THE LEFT) AND +90
(FROM THE RIGHT). A WIND SPEED OF 5 IS A LIGHT BREEZE, A SPEED
OF 30 IS A GALE.
"
8440 INPUT "WIND SPEED (M/S)";X0
8450 INPUT "WIND DIRECTION (DEG)"; X1
8460 WY = -X0 * COS( X1 * C1 )
8470 WX = -X0 * SIN( X1 * C1 )
8480 GZ = VZ : GY = VY + WY : GX = VX + WX
8490 TC = 5 : 'THROTTLE CONTROL
8500 BC = 0 : 'BANKING CONTROL
8510 NC = 0 : 'NOSE UP/DOWN CONTROL
8520 RC = 0 : 'RUDDER CONTROL
8530 FOR I = 0 TO 9 : READ TS(I) : NEXT I
8540 DATA 0,25,50,75,100,150,200,250,275,300
8550 YT = 20 : 'YAW TOLERANCE
8560 RT = 3 : 'ROLL TOLERANCE
8570 TP = 5 : 'PITCH TOLERANCE
8580 LR = 2000 : 'RUNWAY LENGTH
8590 WR = 50 : 'RUNWAY WIDTH
8600 HD = 3E4 : 'DISTANCE TO HORIZON
8610 CLS
8620 PRINT @ 0;
"AIRSPEED BEARING  PITCH    ROLL     ALT       DIST     DEV";
8630 PRINT @ 64,
"..:.:...:.::.....:....:.:...:..:..:..:.:....:.....:.:.::....:...";
8640 GOTO 1000
9000 REM *** FINAL DETAILS ***
9010 PRINT
9020 PRINT "SPEED = "; AS; "M/S"
9030 PRINT "DIRECTION = "; AD; "DEG"
9040 PRINT "DISTANCE FROM END OF RUNWAY = "; ABS(PY); "M"
9050 PRINT "DISTANCE FROM CENTER OF RUNWAY = "; ABS(PX); "M"
9060 PRINT "PITCH = "; PT; "DEG"
9070 PRINT "ROLL = "; RL; "DEG"
9080 X$ = "" : X$ = INKEY$ : IF X$ = "" THEN 9080
9090 END
```

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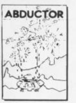
VIC 20



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Your spacecraft must attack the descending aliens and frustrate their evil intent. Fly your Ramjet fighter over the Andes mountain range and protect your llamas from kidnap by hostile UFO's. Features 5 kinds of UFO,controls include up, down, reverse, fire, thrust and smart bomb. Entirely in machine code. Requires 8K expansion and joystick.

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vic 20
TRAXX

TRAXX (8K + EXPANSION) ✪

This is VIC 20 cross breed between the now famed 'Packman' and the game 'Quix'. All in machine code, fast and fun with joystick controls, uses Hi-Res colour graphics. 8K or larger expansion needed.

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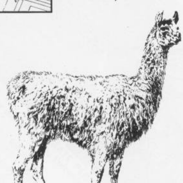
complete with instructions



VIC 20

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Rox is a challenging game involving the defence of you lunar base from a deadly meteor shower. Rox-64 include amazing sprite graphics displays and spacy sound effe and an awesome 'mothership' display if you win the gam Top 10 scores are tabled along with their names. This program shows just what can be achieved using only Commodore 64 basic. Study the listing and learn to use sprites and sound on this outstanding machine.

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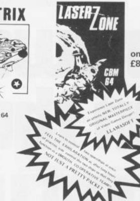
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Bounce 'Sid' the space invader, around the screen into the power pods, keeping away of course from the devil who chases you around the screen. Steer with your Deflex shields, but beware the mines or you may be buried alive! Superb graphics and fantastic sound on the 48K Spectrum

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ZX81

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Centipede
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SCREEN SCROLL

SPECTRUM · ZX81 · ORIC 1 · BBC

GAME: GREAT BRITAIN LIMITED (48K)
SUPPLIER: SIMON HESSEL SOFTWARE
PRICE: £5.95
MACHINE: SPECTRUM (VERSIONS ALSO AVAILABLE FOR ZX81 AND BBC)

I'm assured that the 16K ZX81 version of this is number 10 in the ZX software library. It's a colourful and sophisticated management game that gives you the chance to play at being prime minister of our sceptred isle. The idea is to stay in power for as long as possible. So you must end each five-year term in a popular state.

To start the game, you key in your name and then choose the party you represent – Labour, Conservative, Liberal or Social Democrat. This is not a decision to be taken lightly. I found that a Labour government always started on a much worse footing than the rest, particularly Tory. When the preliminaries have been completed, you are presented with a rundown of the current state of affairs.

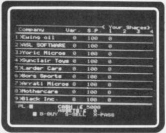
Simon Hessel does stress that this is a game and not a simulation. But plenty of variables are taken into consideration – inflation and unemployment being the key elements. Each year begins with these two factors being updated along with the exchange rate, your popularity rating and the balance of the national account. Their movement depends on your performance in the previous year. There are three ways in which you can control these figures.

First you must set the levels of income tax, corporation tax, VAT and excise duties on tobacco, alcohol and petrol. These will determine your total income at the end of the year. They will also affect unemployment, inflation and your popularity rating.

Next you must set the levels of social benefits, including child allowance, pensions and unemployment benefits. The populace are particularly sensitive to any of these, especially to pensions falling behind inflation. Finally, you are given the opportunity to plough money into some worthy cause in the hope that a social reform will be recognised. At the end of the year, news flashes will appear on the screen concerning riots or party revolts which may force you to revise your policies.

After five years an election takes place. You may be given the chance to outline your manifesto for the following term. This involves apportioning 1,000 points between four areas of social concern: inflation, unemployment, overseas aid, and law and order. Then you sit and watch as the results clock up. **Dick Olney**

GAME: STOCK EXCHANGE (16/48K)
SUPPLIER: ASL SOFTWARE
PRICE: £4.50
MACHINE: ORIC 1



```
                              < Your Shares>
Company          Var.  S.P.   1   2   3   4
1)Ewing oil       0    100    0
2)ASL SOFTWARE    0    100    0
3)Yoric Micros    0    100    0
4)Synclair Toys   0    100    0
5)Larder Cars     0    100    0
6)Borg Sports     0    100    0
7)Arrati Micros   0    100    0
8)Mothercare      0    100    0
9)Black Inc.      0    100    0
PL. ■          CASH £ 5000
               ASSETS £ 0
    ■ B-BUY  S-SELL  X-PASS
```

This game came to me on the other side of Dungeons of Intrigue, but is being sold as a separate piece of software with an 'Etch-a-Sketch' program on the other side. The same difficulties in loading were experienced as with Dungeons, but after changing some program lines I eventually got it up and running.

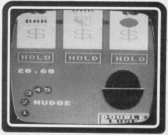
The aim of the game is to make a killing on the stock market. You start with £5,000 and have the option of buying or selling shares in a range of companies like Ewing Oil, Yoric Micros, Synclair Toys, Borg Sports, ASL Software and Mothercare.

I started by sinking all my cash into Yoric and ASL – and 'sinking' is the right word, because share prices in these companies promptly plummeted. I then spread what was left of my funds a bit more evenly, and gradually began to recoup my losses.

For each turn you have the option of buying, selling, or leaving things as they are; shares held, market fluctuation and cash in hand are all updated automatically.

One thing that began to annoy me was the fact that fluctuation in share prices seemed to be much too random – it was very hard to discern any market trends. I enjoyed playing Stock Exchange but it didn't hold my attention for too long. It's the sort of game that is fun to play once or twice, but I can't see it proving addictive. Any number from one to four can play. **Steve Mann**

GAME: ARCADE ACTION
SUPPLIER: ACORNSOFT
PRICE: £11.90
MACHINE: BBC



I must admit I am generally suspicious of multi-games packs, since they often disguise low quality. Perhaps surprisingly, after the way it approached the Atom software, this is the only such package that Acornsoft is offering for the BBC micro. It contains a selection of old favourites including Invaders and Breakout.

Invaders is a one- or two-player game with nine skill levels. Each player may choose a different level of play, which is a novel feature even for stand-alone Invaders. The game moves smoothly and quickly, with plenty of flying saucers and all the standard features. The invaders and saucers seem very large and are quite easy to hit at the start. But so is your base. They speed up quite dramatically when there are only a few left, and the last remaining invader really does move like a rocket.

Breakout is also of good quality and is attractively colourful. As well as the standard game there are three optional features: double bat, moving walls, and captive balls. Any combination can be chosen, giving a set of eight different games. As in many versions of Breakout, the bat moves quite slowly in normal mode. In this game, pressing the shift key gives double speed, a feature that I liked.

The third game on the cassette is another early arcade original, Dodgem. You move a car through a maze of six concentric square tracks with four crossing points between them. A computer-controlled car is travelling in the opposite direction and determined to get you. This ver-

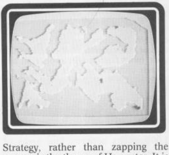
➡94

SCREEN SCROLL

93→ sion is completely standard, with the favoured 'Z', 'X', ':' and '/' keys for movement and the space bar for acceleration.

Finally, we have an interesting variation on the game where you must avoid crashing into your own tail, now immortalised in the film *Tron*. Snake is a one-player game in which you guide a small white square around the screen attempting to eat 'food'. If you don't reach the food in time, it fades away. If you do eat it, your points are increased and the tail which follows the course of your dot grows a little. You end up with a long snake behind you. If at any point you guide the dot (now the head of the snake) into it or into the boundary lines, a life is lost. Each game consists of three lives. Snake is an interesting and surprisingly addictive variant of a stunningly trivial game. **DO**

GAME: HARVESTER
SUPPLIER: PIXEL PRODUCTIONS
PRICE: £7.95
MACHINE: VIC-20



Strategy, rather than zapping the enemy, is the theme of Harvester. It is intriguing rather than exciting, depending on planning more than fast hand-to-eye coordination.

Up to four people can play, each driving a harvester which gobbles dots scattered about the screen.

When the game is RUN, the screen fills up with coloured dots known as parcels of Boosterspice. The distinctive harvesters for each player are placed at random. To the right of the screen are simple direction codes: 1 for up, 5 for down, 8 for north east, and so on. You make a move by typing in your personal code (A-D) and the direction code of your choice. You can take as much time as you like to make up your mind, and then use the Delete key to change it. Hitting RETURN makes the move.

The harvester trundles off, gobbling dots in your chosen direction as far as it can go, to a pleasant musical accompaniment. It stops when it hits the edge of the screen, meets another harvester or runs out of dots. Moving in a direction which is thus barred, without any dots left to gobble, ends the round.

The player's score is then reduced to zero and other players' scores are carried over the next round.

The strategy is to try to munch a line of dots in such a way that your opponent is isolated in as small an area as possible.

The graphics are simple but effective and include a rather powerful screen flash routine in the second half if you fail. The sound effects also work well. Harvester's biggest appeal is the fact that it is a game for the intellect rather than a sublimated desire to zap other entities. **Karl Dallas** →97

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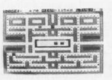

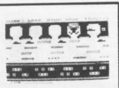

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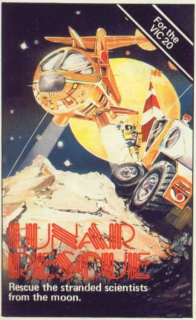

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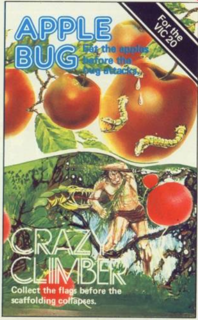

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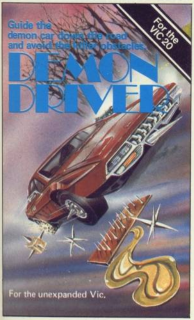

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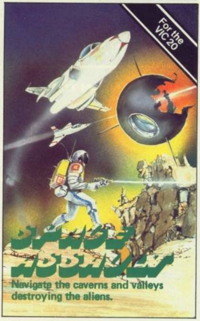

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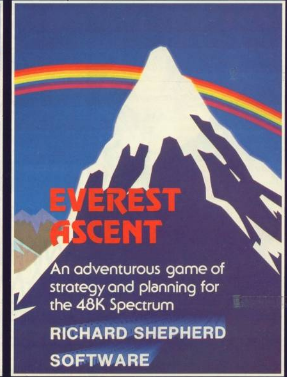
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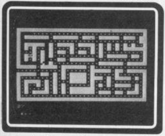
SCREEN SCROLL

UNEXPANDED ACE · APPLE II · COMMODORE 64 · SPECTRUM

GAME: MICRO MAZE
SUPPLIER: HI-TECH
PRICE: £6.50
MACHINE: UNEXPANDED ACE

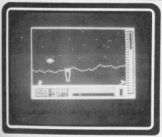


Again the instructions are confused between upper and lower case. Once this is sorted out, loading is straightforward.

Micro Maze is a simple Pacman-style game. You roam the maze, eating as many radioactive dots as you can, while keeping an eye open for the pursuing monsters. If you manage to clear one maze of all the dots, the screen clears and you move onto a higher level – with the monsters getting quicker, and much more likely to catch you. That's all there is to it – there are four levels of skill and you automatically move onto the next level as you clear the screen. You also have a choice of three mazes.

I found this game surprisingly enjoyable. Its best friends would hardly call it sophisticated, and the graphics are somewhat on the simple side. But it is surprisingly addictive and certainly worth a look if you own an unexpanded Jupiter Ace. **SM**

GAME: LUNAR LEEPER
SUPPLIER: SIERRA VISION
PRICE: £19.95
MACHINE: APPLE II



What a relief to play a game, get thrashed, collapse in heaps of laughter and then try again . . . and again . . . and again. If you are like me, you will laugh at the wrong times and forget what you are doing. It gives the program an extra advantage as you laugh away another life.

You are a spaceship above the moon, running out of fuel, and your shipmates are stranded on the surface. All you have to do is pick them up – by the head. Easy, you may think. Well, it would be if only the Lunar Leepers with their voracious appetites would stop eating the castaways and spaceships.

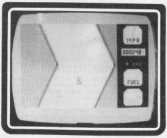
Once you have completed this task, stage two begins. Your mission: to boldly go where no spaceships should ever be and (fans of *The Perishers* cartoon strip will love this) shoot the eyeball in the sky. As luck would have it, the eyeball is at the end of a cave defended by Trabants.

The game is on one disk with accompanying fold-over instruction card. The instructions are brief but accurate and the game allows a keyboard, joystick or Atari joyport for controls. If the keyboard is selected, the player is asked to define which keys are to be used during play. Once into the game, the graphics and sound are excellent.

Starting at level one of eight, the play is relatively easy, as long as you suppress the odd chortle. In fact, it is worth making a few mistakes just to see the results. As you move up through the levels, more Leepers and spaceship-like Trabants hinder your mission. Eventually, Trabants become unkillable. This may be unfair but it does increase the excitement.

I so enjoyed this game that I assumed I was biased. But I coerced a couple of non-game players to have a go. Result? Addiction. **Nigel Cross**

GAME: MOTOR MANIA
SUPPLIER: AUDIOGENIC
PRICE: £8.95
MACHINE: COMMODORE 64



The Commodore 64 is very strong on sound, high-resolution graphics and colour. It deserves to have programs which will exploit these qualities.

Car-driving games are sufficiently testing to be a challenge while not being as frustrating as aircraft simulations. Choosing one of nine levels of difficulty, you steer you car around a track which includes motorway sections, ordinary roads and dirt track tests.

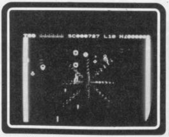
You will meet hazards – including slick patches and avalanches of boulders – on the way. You have to pass other road users, and the local ambulance crosses your path. There are realistic engine noises as you drive, and a constantly changing speedometer. You also have to keep an eye on a gauge which tells you if you are driving too slowly to keep your battery charged and on a fuel gauge that warns you to call in at a garage before you run out of petrol.

All this is complicated by hazards such as logs in the middle of the road – hitting one will cause your engine to overheat, signified by a flashing light followed by an oil warning light. If you fail to get to a garage in time, your engine dies. And there are potholes to make your steering go haywire.

Each map section completed earns an extra 1,000 miles. If you clock up 5,000 miles you get an extra car to add to the five you start with. If you still have four cars in the garage at this time, you score a massive 10,000 miles.

Motor Mania is a first-class arcade game of absorbing interest, and requiring considerable skill. It is a pity that it comes on cassette, even if a cartridge would be more expensive. This is because this is a game likely to be in great demand in the home, and waiting for the cassette to load will prove frustrating. **Barry Miles**

GAME: ARCADIA
SUPPLIER: IMAGINE
PRICE: £5.50
MACHINE: SPECTRUM



Now this really is something special ... The bright young things at Imagine have confidently pledged themselves to the production of totally original arcade-style software for a variety of home machines – no Pacman rip-offs here.

First impressions of Arcadia are of a high degree of professionalism. The colourful cassette insert credits the game and graphics designers; take a

SPECTRUM · BBC

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bow, D Lawson and M Butler. Arcadia also offers a lifetime guarantee. If one of their games fails to load it will be replaced at once, free of charge. This is certainly a step to be encouraged. Instructions for setting up are clear and concise, and there's a touch of sly humour in that the alien beasties you are battling against belong to the Atari-an Empire. Of course, it could just be coincidence ...

The object of the game is fairly standard zap-the-alien stuff. The alien fleets attack in waves, and there is a timer at the top of the screen. If you manage to destroy a whole fleet before the timer reaches zero, another replaces it. Conversely, if the fleet fails to destroy your ship (the Arcadia) in this time limit, it will break off the attack and home a new wave.

There is a wide choice of control keys, so it is easy to configure the keyboard to suit your particular finger-span. There is also a 'freeze' facility: any key on the top row halts execution, enabling you to take a break.

Arcadia is very deceptive in the early stages. Playing the game for the first time, it is highly unlikely you'll get past the initial stage of fairly ordinary-looking alien ships. But as you improve you can appreciate the truly stunning graphics. There are 12 different waves of attackers: mutant butterflies, birds, spinning circles, octopus-type shapes, even a mini-Centipede game. If you manage to get through four levels intact, you get an extra ship (you start with five). I am told that there is someone out there who has reached the 53rd level, a claim I find hard to believe as the Atarian Empire is no soft touch.

This cassette really does show that, given sufficient imagination, Spectrum graphics can match up to almost any other machine around. **SM**

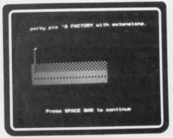
GAME: PHILOSOPHER'S QUEST

SUPPLIER: ACORNSOFT

PRICE: £9.99

MACHINE: BBC

This is one of a pair of adventures which Acornsoft has included in its range of BBC software. The other one is called Sphinx Adventure. I suspect it is the easier of the two, although I haven't yet seen it. Philosopher's Quest is an interesting and complex adventure with a fairly standard vocabulary.



porky pie 'S FACTORY with extensions.

Press SPACE BAR to continue

The Ancient Mariner and his albatross make an early appearance. And in one room you apparently cease to exist! The text is varied, but without the humour of some adventures. It has the advantage of not repeating the full description of a room every time.

This game is one which would appeal only to the most patient adventurer, and could provide months of mental turmoil even for the most experienced. As you might have guessed, I hadn't got very far by the time this review was completed, but I haven't given up yet!. **DO**

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SOFTWARE: 'TEVLINK' package provides 2-machine parallel link (2 Boards needed), overall speed about 8K DATA bytes/second with error checking. A PRINT SPOOLER is included (only 1 Board needed): connect printer port to VIA board on receiving micro and use normal LIST/PRINT etc.

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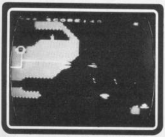
GAME: EASTERN FRONT
SUPPLIER: ATARI PROGRAM EXCHANGE
PRICE: £23.99
MACHINE: ATARI



This is one of a large selection of packages distributed by Atari but written by non-Atari personnel. Atari does apparently pay quite good royalties if the program sells and it's a good way of making available software which might otherwise never be published. Eastern Front has achieved such success that creator Chris Crawford has been given a job with Atari's elite software team in California.

The game is a one-player simulation of the German invasion of Russia during World War II, in which you have the job of controlling the German forces. The playing field is a map of Western Russia, covering three or four screens' length in each direction. Using a joystick, you move a purple square around the map, which scrolls over if you reach the edge of the screen.

Russian military units are seen as red squares, and German ones as white. To identify any unit and its strength, you must position your purple square over it and press the fire button on your joystick. Each turn you may give up to eight orders to each German unit. These amount to instructions for movement in a particular direction. They are given by pressing the fire button whilst your square frame is in position over the appropriate unit, and – keeping the button pressed – moving the joystick in the direction you wish the unit to move (not diagonally).

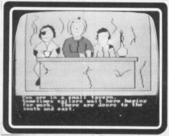
When you have completed your orders, pressing the start button initiates the procedure which figures out their results. A unit will not carry out all your orders exactly for a number of reasons. Firstly, it may come into conflict with an enemy unit by trying to move into the other's space. In this case, the result of the conflict will be determined by the fighting strength of each unit along with various random factors, and one unit will be forced to withdraw. Associated with this is the inability, under certain conditions of, your unit to move through a Russian unit's zone of control.

Secondly, a German unit cannot move into a space already occupied by a friendly force, and will merely wait until the other has moved. Finally, the number of spaces which a unit can move each turn is limited by its own nature (infantry or tank regiment), the terrain it is crossing and the season of the year. The game runs from 22 June 1941 to 29 March 1942, with each turn representing one week; the current date is displayed at the top of the screen.

Your score appears in the bottom left hand corner and is reassessed each turn, the idea being to end the game with the highest score possible out of 255. Since this score fluctuates in both directions, there is no point in playing part of a game. As there is no game-save feature, you will have to leave your computer on or allocate several hours each time you boot up the disk.

The graphics are the most obviously impressive feature, with the colours changing according to the season. There can be no doubt that this is a fine piece of programming. **DO**

GAME: ULYSSES AND THE GOLDEN FLEECE
SUPPLIER: SIERRA ON-LINE
PRICE: £25.30
MACHINE: IBM PC
(VERSIONS ALSO AVAILABLE FOR APPLE AND ATARI



```
You are in a small tavern.
Sometimes sailors wait here hoping
for work.  There are doors to the
south and east.
```

'You must become Ulysses,' says the manual. 'Your task: to find the Golden Fleece and return it to the King. The perils are many, your foes powerful. But with courage, logic, intuition and luck, you can survive and take with you the secrets of sorcerers. Now, sit back, close your eyes, and I'll spin a spell to open time's portals ...'

The game is for one player and is set in a number of locations, including the King's town, a tavern, a shop and Colossal Island. Each location has its own picture, which comes on the screen when you get there – in the time I was playing, I found at least 20. In each of these places you will bump into people – guards, sailors, shopkeepers – or stumble across objects to take on your quest.

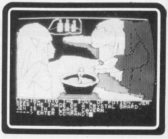
If you stumble across a mysterious floating bottle, for instance, you just type GET BOTTLE. The item is then added to your baggage and disappears from the picture.

You start off in the town. From there, you can move north, south, east or west. You may speak to anyone you meet, to see whether they have any helpful information. Robbers may steal some or all of your possessions. You may be able to buy something – or you may find that what you thought was money isn't legal tender here.

The instruction book does not tell you much about what you can or cannot do. Part of the fun is finding out for yourself, and you will need to use your imagination to find the right commands. The game certainly has a sense of humour. When I was unable to get any sense from a guard, I typed in KILL GUARD. The response was 'That wouldn't be nice. Besides, he's bigger than you'.

I was not particularly impressed with the graphics – I've seen better on micros such as the Apple or Atari. But only a mad millionaire is going to buy an IBM PC for games. This game, and others like it, will be played by the boss in the evenings. It could give a new meaning to 'working late at the office tonight, dear'. **Mike Whitney**

GAME: THE DARK CRYSTAL
SUPPLIER: SIERRA ON-LINE
PRICE: £
MACHINE: APPLE II



```
SEES THE IMAGE OF A CRYSTAL SHARD.
JEN IS IN A LARGE CAVERN.
----> ENTER COMMAND?
```

This is an adventure game in the great tradition. You are Jen, last of the Gelfling race which was exterminated by the evil Skeksis. They control the land with the aid of the powerful Dark Crystal, damaged centuries ago when a shard broke off and was lost. Now you must find the shard, heal the crystal and defeat the Skeksis.

Getting the game up and running

→102

101→

could not be simpler. You gently shove the disk in the drive and boot. The first picture on the screen shows Jen sitting on a rock playing his pipes. From then on, it's up to you.

The game is sixth in the Sierra-Online Hires Adventure series and uses the same code as the previous ones. I found it more frustrating than its forerunners, and more arbitrary. One classic example is the time I was spotted by a bat with a crystal eye. It took only one bat-sighting, followed a few turns later by the appearance of one of the Garthim (invincible nasties) to hammer home the message that Bats Meanz Garthim. I got killed that time.

After rebooting and retracing my steps from the map I had drawn so carefully, I was spotted by another bat. I was only two moves away from the hill where the Landstriders grazed, so I headed for it and arrived just in time. Then up came a Garthim. To my intense displeasure, I discovered that being in the presence of Landstriders – who get their kicks in life by kicking the life out of Garthim – makes not one bit of difference. You wind up just as dead.

In an adventure game there are very few situations in which an operator error can cause a problem. In the case of the Dark Crystal, the need to load each picture-file from disk means you could confuse disks, causing a 'file not found' error. The same problem could occur when you move from one disk to another. In both cases, the program explains what the machine thinks might be happening.

It is best if you play this on a colour TV as it loses most of its appeal in mono. However, since it is based on the American TV standard, the colours are blurry. **Richard King**

GAME: ZODIAC
SUPPLIER: TANSOFT
PRICE: £9.99
MACHINE: ORIC 1

Zodiac is a full-length adventure for the 48K Oric. Using slow format, the program loaded successfully, but took half an hour to do so.

This features a very large vocabulary and uses the large memory to very good effect. It's a standard text adventure. You start in a small hut and wander through various locations retrieving treasure. There are six valuable objects to be retrieved and it will take you a long time to complete the whole game – Tansoft reckons five hours for a seasoned adventurer and 50 or more for the novice.

There is a good range of locations and plenty of detailed description. If you find yourself in a room, the Oric will tell you that it has high ceilings, a sturdy mantelpiece and exquisite panelling, which denotes that the house owner has good taste and high financial standing. You are not restricted to simple verb/noun instructions. You can add descriptive adjectives which will affect the way the computer carries out your orders.

Music is added at relevant points of the adventure – at one location you come across a radio that is playing the theme tune from the Archers. This detracted from my enjoyment as the sound did terrible things to the screen display. I assume that production Orics are now free from this annoying feature.

Sound bugs aside, this is a very nice piece of software. I am not an adventur addict, but I think this is a game I would return to. **SM**

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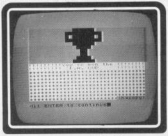
MACHINE: SPECTRUM



When I first received this game, I spent the best part of a weekend playing it. Since then, I have returned to it more often than any other.

The object of the game is to pilot your chosen team from division four to the league championship, on the way winning the FA Cup as often as possible. The game mirrors reality in that a good Cup run will give you greater attendances, hence more money at the gate. Conversely, losing too many games cuts your income and can result in you getting the sack.

You have a maximum of 16 players in your squad and can buy or sell as the situation dictates, borrowing from the bank as necessary. You can change players' names to suit your own foibles and prejudices. Unfortunately, your players must have names of eight letters or less, including initial, so there's no room for Kenny Dalglish.

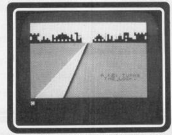
Loading Football Manager for the first time, you are invited to enter your name and then choose a team from the 64 on offer. No matter which team you choose, you start the game in division four – which must be particularly galling for Liverpool fans. If your favourite team is not represented, you can select any of the others and then change the name. You select your skill level from a choice of seven, ranging from beginner to genius. You then choose your team's colours – this is not too realistic as you are restricted to black or white – and the game begins.

The truly addictive quality of this game is the remarkable way it mirrors a real football manager's problems. Each player in your squad is rated between 1 and 5 in skill. This rating affects his price in the transfer market and his cost to you in wages. In addition, each has an energy value of 20 or less. Each game played reduces this value by one, while resting the player for one game boosts his energy by 10. Your team's performance will depend on values obtained from the skill and energy ratings of the players, plus a morale factor. Lose games and this goes down, making you more likely to lose again. This is identical to a real team's performance.

So far, the game is purely textual. Now the fun begins. Having selected the most suitable team for the forthcoming game (you have a dossier on your opponents' skills, morale and energy), you have to sit back, biting your nails like any real manager, while the game is played. This is done in a series of goalmouth scrambles. Successful shots are greeted by an electronic scoreboard flashing 'GOAL!' and the match score is displayed.

It should be stressed that this is not a short game – there are 15 games in a season, plus the various rounds in the FA Cup. To get from division four to the league championship at any of the higher skill levels is going to take you a week of playing every day. **SM**

GAME: PIMANIA
SUPPLIER: AUTOMATA SOFTWARE
PRICE: £10
MACHINE: SPECTRUM (OTHER VERSIONS AVAILABLE FOR DRAGON, ZX81 AND BBC)



I'm not too sure that Christian Penfold and Mel Croucher should be allowed to walk the streets. Both of them are obviously warped…

What we have here is a world where saxophones turn into hang-gliders, where red herrings swim across the bottom of the screen blowing bubbles of derision, and where snatches of music confuse, hinder and occasionally help you. Along the way you'll be greeted by a blatant appeal for cash – they promise to send you a T-shirt, but what makes you think you can trust them? Throughout your adventures you'll be involved with the Pi-Man who will give you presents of useful things like blackboards, then next minute rob you blind.

It's a game that encourages all that is noble in the human spirit – namely naked, ravening greed. The prize is a specially designed £6,000 gold and diamond sundial. Whoever wins it will certainly deserve it, but will undoubtedly be a gibbering lunatic by then.

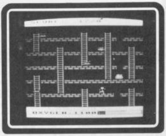
Seeing as there's so much at stake, I'm not going to tell you too much – why should I help you get rich? Suffice it to say that it's an adventure. But the objects are not your run-of-the-mill swords, magic rings and potions – you pick up TV dinners, cans of worms, handfuls of valium…

The object is to get through the Gate of Pi, which will reward you with a place name and date. Turn up at the appointed time and an Automata person will hand over the goodies.

There are potential clues in everything, probably even in the horrendous 'disco single' on the other side of the program tape.

The Pi-Man does a mean hokey-cokey. The animation makes nonsense of the fact that the Spectrum is a slow computer. And the cassette case should carry a government health warning: this game can damage your brain. It would appear that Automata staff are not expecting an early winner – if no one shows up on the first date set they promise to return at the same time on the same day of every year until the prize is won. **SM**

GAME: MONSTERS
SUPPLIER: ACORNSOFT
PRICE: £9.95
MACHINE: BBC



One of my arcade favourites is a game called Space Panic. Monsters is an exact reproduction of the original, right down to the sound effects.

You control a neatly drawn little man who runs around five floors linked by various configurations of ladders while being chased by monsters. As you might guess, the idea is to kill all the monsters as quickly as possible. Instead of a weapon, the little man is equipped with a spade with which he can dig and fill in holes. →

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BBC · VIC 20

104→ So he must dig a hole, wait until a monster falls into it, and then quickly fill the hole in before it can crawl back out. The unfortunate creature falls to the floor below and dies. The 'X' and 'Z' keys control horizontal movement, ':' and '/' vertical, and 'D' and 'F' digging and filling.

In the first frame there are three red monsters, which look like huge tomatoes. If you kill all the monsters, a little tune is played and a new frame appears. This time there are five red tomatoes. From the second frame onwards, any monster who manages to climb out of a hole mutates into a more devastating form. A red one turns green, and a green one turns white. The green and white ones are different, incidentally, and don't look at all like tomatoes.

Green monsters must fall through two vertically aligned holes, and whites through three. If any monster falls on top of another they are both destroyed. In addition to this, the green and white monsters are much smarter than the red ones and will follow you around relentlessly so that it is difficult to find time to dig any holes.

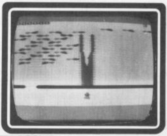
Your oxygen level is shown by a red and yellow bar at the bottom of the screen; this gets progressively shorter throughout the frame. When it reaches red the little man tires and eventually crashes to the floor and dies. This is not a real problem in the first few frames. Later on, when you may find yourself tackling several green and white monsters, it becomes vital.

As have said, Acornsoft's Monsters is high quality. The responses, graphics and sound effects are impeccable, making for one of the best games around. **DO**

GAME: KAKTUS
SUPPLIER: AUDIOGENIC
PRICE: £7.95
MACHINE: VIC 20

The good news is that this is a good, challenging game that makes imaginative use of the Vic's graphics. The bad news is that you need at least an 8k expansion to run it.

A cactus in the centre of the screen is being eaten by wasps and hornets. You are a gopher who must scamper from left to right in a tunnel under the cactus, shooting at the insects to protect it.



When the game begins, the graphics are invariably off centre. You can move them back with the cursor controls – but take care not to move them too far.

There are more than enough hazards in this game to keep you on your toes. The insects release acid drops which can erode the ground over your burrow. If they hit you, you are killed. On the other hand, this does provide extra holes to fire through. As gopher, you are allowed to come out of the burrow. But you →109

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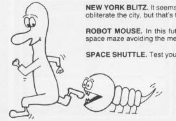

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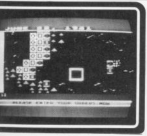
107→ are then much more likely to be hit by the acid drops. You are also in danger of being trapped above ground by the occasional mole which may close up the entrance to the burrow.

The game ends when all three lives are gone or when the insects succeed in eroding the base of the cactus so that it falls.

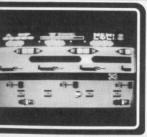
You control the game with a joystick or with easy-to-use keys. Note that the L key, which is used to fire, does not repeat if held down.

Kaktus is sufficiently interesting to interest players who have become bored with variations on the alien attack theme. The graphics are simple but effective, and the mole provides enough of a 'wild' element to add to the general interest. **Karl Dallas**

GAME: PREPPIE
SUPPLIER: ADVENTURE INTERNATIONAL
MACHINE: ATARI 800
PRICE: £21.99



GAME: FROGGER
SUPPLIER: ON-LINE INC
PRICE: £22.75
MACHINE: ATARI 800



These two are essentially the same game, both being glossy versions of the arcade favourite. Frogger, as you might guess by the name, is the original copyright version, while Preppie is an amusing variation.

For any of you who have yet to sample its delights, Frogger involves manoeuvring a frog first across a busy road and then across a river to reach a home base at the top of the screen. There are four lanes of traffic on the road, two lanes in each direction, and the speed of this increases as the game progresses. The frog must avoid touching any of the vehicles. On the river the opposite applies, since the frog must leap onto moving streams of logs, turtles and crocodiles to get across. Believe it or not, the frog drowns if it falls in the water.

Things are made more difficult by deadly snakes which wander across the grass between the river and the road, and by various creatures which lie in wait at your home base ready to gobble you up.

The version of Frogger for the Atari is fairly true to its ancestry, except that it is only a one-player game, and each game consists of five frogs. There are 'lady frogs' which wait on logs for your controlee (which is presumably a gentleman frog) to escort them home. Leaping on top of this frog of the fairer sex allows you to control the happy pair as if they were a single creature. The game has two speeds.

Preppie has a similar layout but with only three lanes of traffic on the road and on the river. In fact, the road is a fairway and is populated with lawnmowers, golf cars and bulldozers. The river starts off with boats only on it, but logs and crocodiles appear later on. Instead of a frog, you control a young student – 'preppie' is a US term for rich spoilt kids who have attended public school. The preppie's name is given in the story which accompanies the game as Wadsworth Overcash.

Because of a bizarre college tradition, Wadsworth has to retrieve golfballs on a very dangerous course. In the first frame there is only one golfball. It lies on the other side of the green, and must be retrieved and carried back to the starting zone. As the game progresses more balls appear. Only one ball can be carried at a time and there is a time limit. Incidentally, instead of a snake threatening you in the central reservation there is a giant frog!

Preppie can be played by one or two players using either one or a pair of joysticks. In both Preppie and Frogger the graphics are superb, and they both include melodic but repetitive tunes. The music can be turned off without losing the other sound effects by pressing SELECT on Frogger or SHIFT and 'M' on Preppie.

I like both of these games, and to be honest there is not much to choose between them. Preppie wins out in terms of presentation, but the long sequences between each term make it slower. It also includes the option of starting at any level between one and nine, which can be useful once you start to master the game. **DO**

GAME: THE KING (ORIGINALLY SOLD AS DONKEY KONG)
SUPPLIER: MICRODEAL
PRICE: £8
MACHINE: DRAGON 32

This is a version of the curiously named arcade game 'Donkey Kong'. The scenario is an old warehouse where a huge gorilla (clearly a relative of King Kong) is holding a young woman prisoner. Each of the four frames has a different configuration of horizontal girders linked by ladders, with the belligerent ape and his terrified captive at the top.

To start with, your job is simply to climb from the bottom of the screen to the top and rescue the girl. This is complicated by the endless supply of barrels which are consistently hurled at you by the gorilla.

You use the joystick to control a little character who leaps when you press the fire button. Apart from jumping over the barrels, your only defence is to smash them with a mallet, of which two are available at different levels of the screen.

These mallets will destroy the fireballs which wander about the place. But possession of them is temporary, and you cannot climb any ladders while holding one.

If you reach the top on the first frame the scene changes. Now you run over eight 'plugs' symmetrically positioned in the structure. These then disappear – causing the girders to collapse and the gorilla to fall to the floor. This time there are no barrels but plenty of fireballs.

As the game goes on, all sorts of further hazards appear. These include conveyor belts, furnaces and lifts, each demanding a different strategy.

I have always felt this game was one of the most interesting and challenging around, and this version is one of the best you'll find on a micro. It offers two different playing speeds, for one or two players, with the option of a 'practice' game in which you get 12 men instead of three. Full instructions are available at the beginning.

Three copies of The King are included on the tape, giving three colour schemes. The third is in the highest resolution graphics. It is thus less colourful than the other two, but was my favourite, with crisp detailed graphics almost up to the standard of its arcade peer. If I had to recommend one arcade type game to a Dragon owner, this is the one I'd choose. **DO**

☞111

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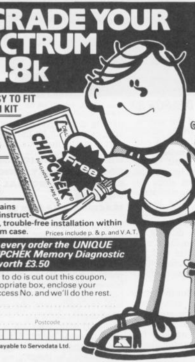

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SCREEN SCROLL

DRAGON 32 · ATARI · IBM PC

109→ **GAME: KATERPILLAR ATTACK**
SUPPLIER: MICRODEAL
PRICE: £8
MACHINE: DRAGON 32
(VERSION ALSO AVAILABLE FOR ATARI)

No prizes for guessing that this is the Dragon version of Centipede, the copyright of which is one of those held by Atari UK. It is licensed from an American outfit called Tom Mix Software.

You move a small oval base around the bottom of the screen while firing upwards at long centipedes/caterpillars, each of whose segments has a life of its own. The playing field is scattered with mushrooms which take four shots to destroy. New mushrooms appear whenever you hit a caterpillar segment. They also appear in the wake of the creatures (fleas in the original but described as spiders in the introduction to Katerpillar) that occasionally hurtle down at you from the top of the screen.

Katerpillar is fast with good graphics and sound. It isn't as exciting as the Atari cartridge version, but is less than a third of the price. My only major criticism is that the base will only move very slightly in a vertical direction so that it is virtually impossible to escape the caterpillar segments when they reach the bottom. **DO**

GAME: FLIGHT SIMULATOR
SUPPLIER: MICROSOFT
PRICE: £35.00
MACHINE: IBM PC (64K)

Far more than just a game, the Microsoft simulator is realistic enough to qualify as a serious training aid for prospective pilots or those with a passion for flying but no cash to indulge it.

You can select a vast number of routes about the North American continent. There are 22 detailed airport layouts to take off from or land at, in weather conditions ranging from daylight with no wind and not a cloud in the sky through to pitch darkness and solid clouds with a tornado raging.

This program is for the dedicated, for people who are prepared to spend many hours in the 'cockpit' learning how to fly. Its long-term appeal for them is undoubted, but less serious flyers could soon admit defeat.

There is a 100-page instruction manual which is easy to read and understand. Illustrations and maps explain the aircraft controls and instruments clearly. The instrumentation, too, is excellent, with a generally rapid response to the controls. With so many variables for the pilot to set, it can be tailored to fit just about any level of skill.

Unfortunately, with such a large area of the world to cover and display, the resolution gives a rather jerky and lumpy appearance. The colours are not quite realistic, and although the graphics are excellent, I have to fault the sound effects.

If you get tired of serious flying, a bonus in this packge is British Ace, a World War I dogfight game. In this, you must shoot down at least five enemy fighters – with differing capabilities – and bomb aerodromes and factories. You battle it out in real time, so it is advisable to learn to handle your aircraft using the flight simulator program before tackling this game. This is one situation where learning on the job will not do. **Nigel Cross**

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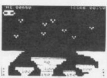

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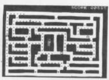

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AFTER THOUGHTS

Solution to puzzle on page 27

Base to New York/New York to Base/Base to Cairo; Base to Rome/Rome to Base/Base to Cairo; Base to London/London to Base/Base to Sydney

Solution to puzzle on page 28

2C and 4D

Solution to puzzle on page 30

Title C. Sequence starts in top left corner, works down the first column, up the next, down the third, etc. The three symbols – circle, square and triangle – are repeated in white and black. Each appears once, then twice, then thrice, etc.

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